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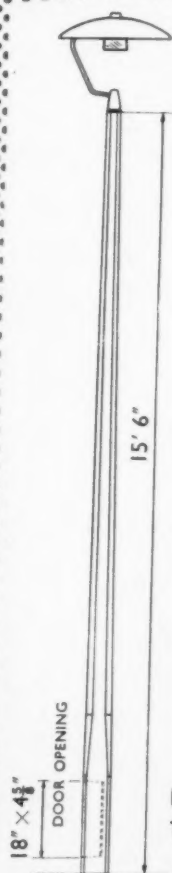
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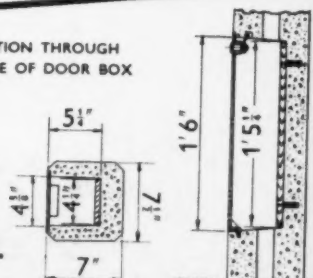
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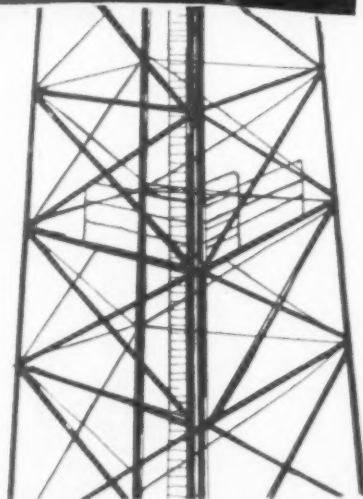
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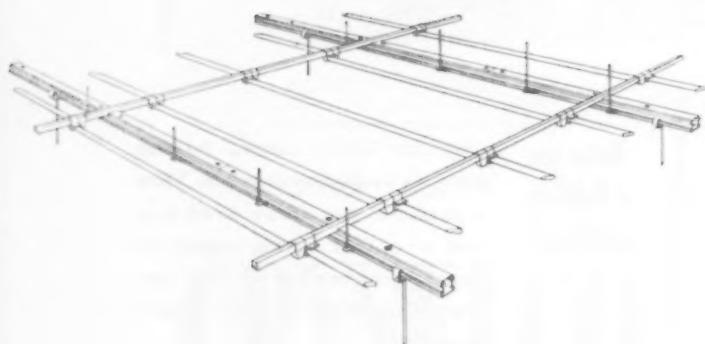
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atlas sylvalume

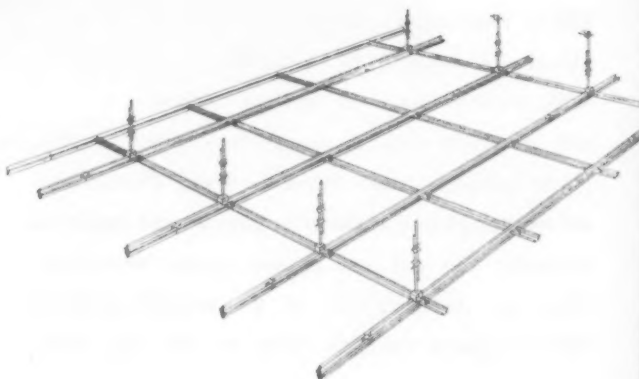
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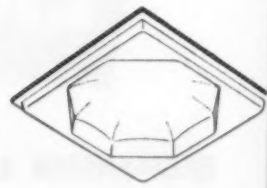
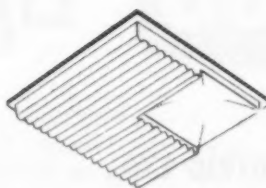
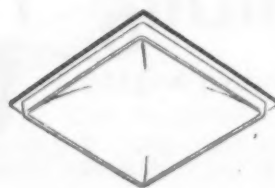
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Trunking and unistrut assembly to support tubes and Sylvalume grid.



Appearance of Sylvalume grid from above.





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In the Atlas Sylvalume system the lighting equipment comprises a modified form of Atlas trunking, accommodating the control gear for the required number of Atlas 8 ft. 125 watt fluorescent tubes. The tubes are supported on cross-beams, and from the trunking is suspended an aluminium grid on a 3 ft. module. Within the grid square vinyl plastic diffusers of differing textures, colours and form

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A.E.I. Lighting at Brussels Exhibition

Inside the British Industry Pavilion, a rectilinear structure of steel and glass curtain walling, the general lighting is wholly indirect. Mazda fluorescent lamps in suspended troughing light up the white painted underside of the aluminium roof, picking out the pattern of the blue-grey structural supports.

Under the canopy before the entrance are clusters of 'Satina' fittings. A group of these fittings, designed by A.E.I., have recently been chosen as one of the Designs of the Year (1958) by the Council of Industrial Design.

The A.E.I. main interior lighting system was chosen from schemes put forward by a number of lighting manufacturers working within a budget limit of £5,000.

Architects: Edward D. Mills & Partners.

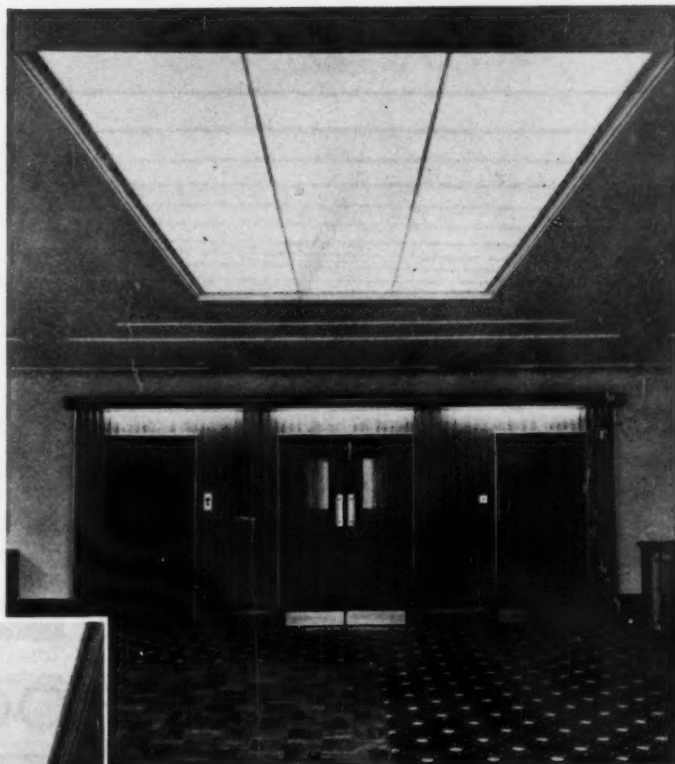
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The entrance hall of The Equity and Law Life Assurance Society's new offices at St. Johns, Hazlemere, Bucks. The ceiling lighting has PLASMATIC* diffuser panels extruded in Erinoid light-stabilised polystyrene by Tube Lamination and Engineering Limited. Inset shows the ease with which these panels can be removed for cleaning.

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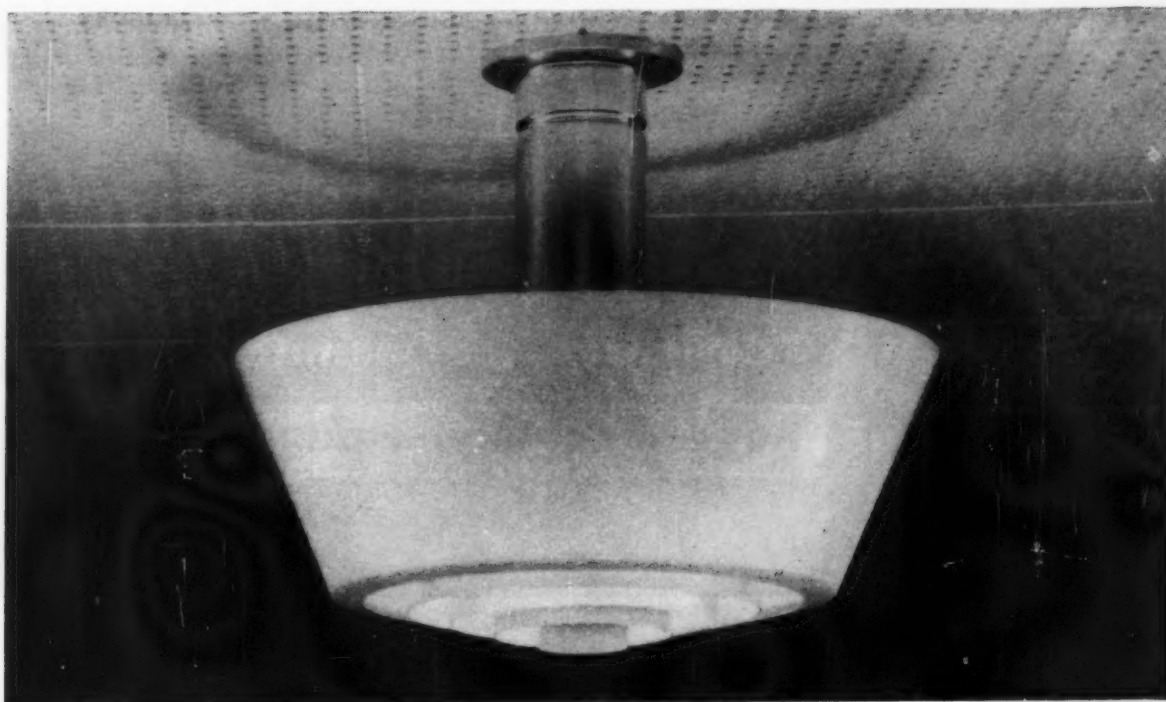
G.E.C.**LIGHTING AT LLOYD'S OF LONDON****'THE ROOM'**

The General Electric Co. Ltd. have supplied the majority of the lighting fittings for Lloyd's—London's largest new building. 'The Room' is illuminated by approximately 15,000 ft. of Osram cold cathode tubing installed in the laylights and 600 circular fittings

*Architect: T. E. HEYSHAM, F.R.I.B.A.
Consultants: OSCAR FABER & PARTNERS
Contractors: HIGGINS & CATTLE LTD.*

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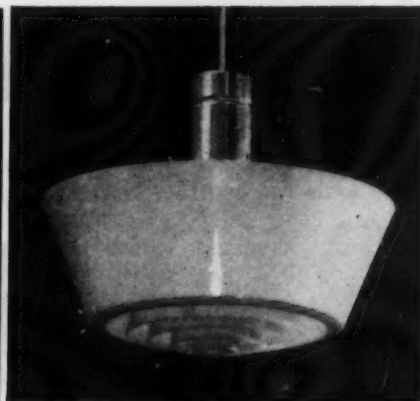
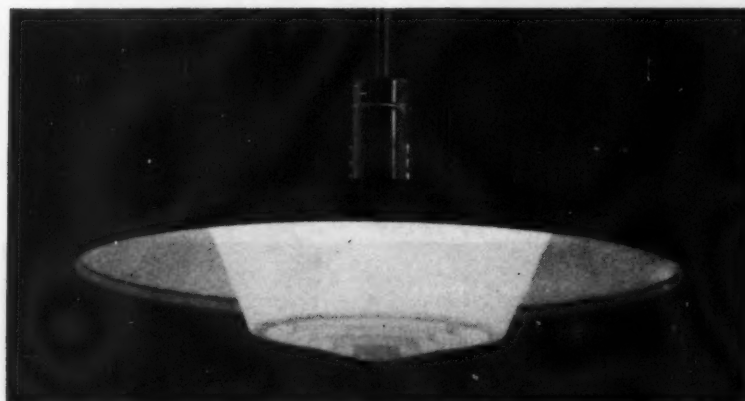
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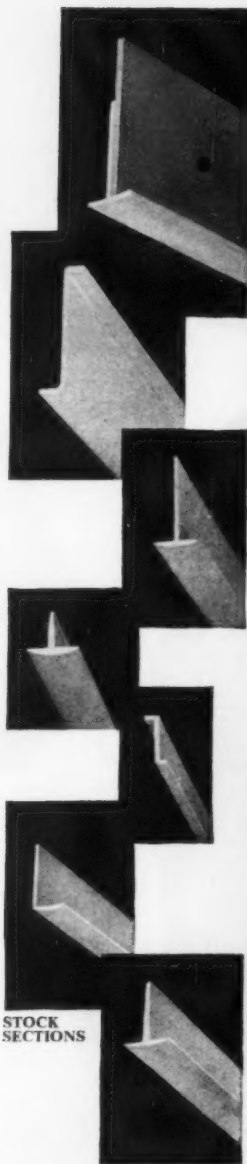
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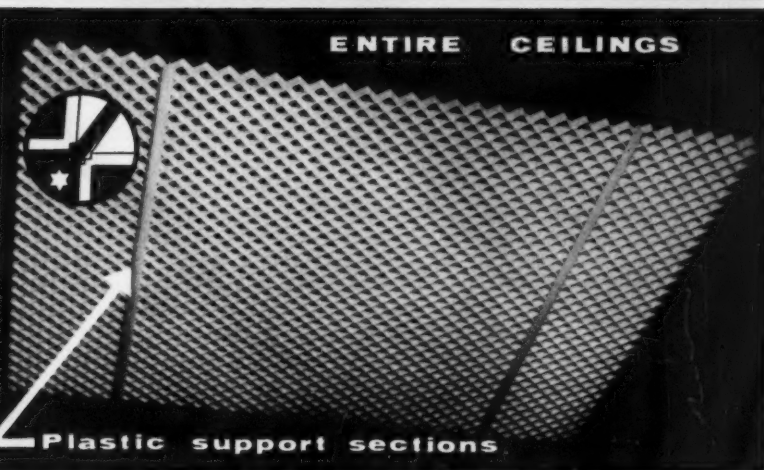
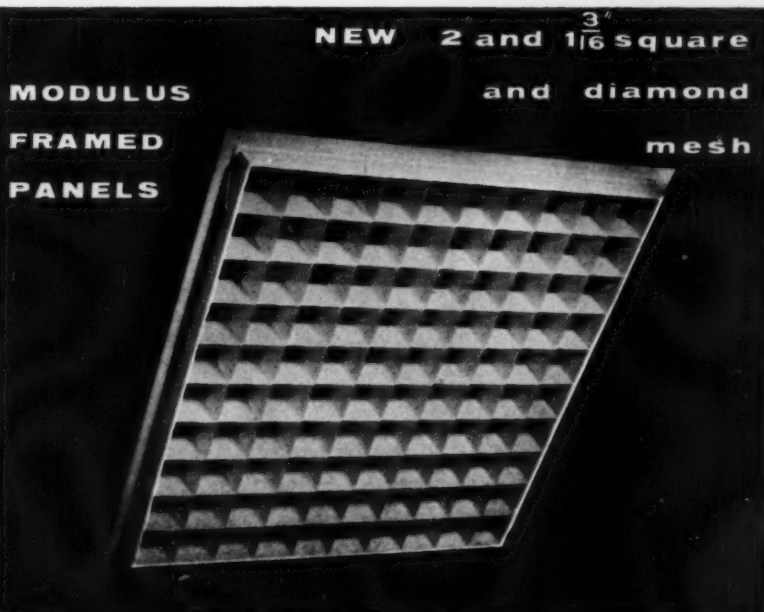
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* Rotaflex 'Ovoid' won the 1957 Design-of-the-Year award

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Light and LIGHTING

Vol. 51. No. 8. August, 1958

Published by The Illuminating Engineering Publishing Co. Ltd.
on the 1st of each month at 32, Victoria Street, London, S.W.1.
Telephone: ABBey 7553. Subscription rate 30s. per annum.

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Reciprocal Greetings

BEING in our Golden Jubilee year it gives us pleasure to offer to another half-centenarian—one of the best known companies in the lighting industry—our congratulations and good wishes for the future. The Benjamin Electric Coy., which was founded in 1908, has a fine record of service to the cause of good lighting, not only as designers and makers of excellent lighting equipment but also as consistent and prominent participators in the I.E.S. Indeed, Guy Campbell Snr., the Company's Chairman, is a Founder Member of the Society and his well-known and popular son of the same name—now Joint Managing Director of the Company—is a Vice-president of the I.E.S. and has served previously in this and other capacities. We remember—in fact we still have—an excellent pocket book of lighting design data issued by the Benjamin Company more than 30 years ago; we might call it a pioneer lighting code. Good technical publications have exemplified the enterprise of this company as well as the production of first-class lighting equipment. No doubt this fine record will be enhanced during the second half-century.

Notes and News

PLANS FOR celebrating the Golden Jubilee of the IES next year are, we understand, beginning to take shape, and from what we have seen of them the objective of making the IES and its work better known should achieve a reasonable measure of success.

The Jubilee will be celebrated throughout the year and throughout the country plus in the Transvaal, where the Society has its only overseas Centre. The complete programme will be announced in due course, but in the meantime we might draw attention to some of the items as typical of what will be going on. At the beginning of the year there will be a display of lighting equipment in Birmingham and a lecture by the President of the International Commission on Illumination, Dr. Walsh, in Liverpool. On February 3 the Newcastle Centre is arranging a special lecture to be given by Dr. Aldington, with Sir Kenneth Swan in the chair, to mark the eightieth anniversary of Sir Joseph Swan's first public exhibition of the incandescent filament lamp.

As the IES was founded at a dinner held at the Criterion Restaurant in London on February 9, 1909, a commemoration dinner will be held in the same place on February 9, 1959. Similar functions will be held by each of the Centres on the same evening and the speeches from the dinner in London will be relayed to each of them. (Whether the Transvaal can be included in this hook-up has yet to be investigated.) This will be a most notable occasion in the Jubilee activities and it would be very nice if every member of the Society could be present at the London dinner or his local Centre function.

During the year a number of exhibitions and displays are being organised in various cities and regional conferences are to be held in Peebles, York and Southport, with the possibility of others which are still being considered. A number of Centres have also arranged, with the co-operation of electricity boards and manufacturers who are lending equipment, for the floodlighting of places of interest. These activities, together with the programme of lectures to the public and to other bodies, should do much to bring the Society to the notice of many who have either not heard of it or who do not appreciate the influence it has had on the well-being of the community.

The arrangement of a programme such as we have very briefly outlined naturally involves collaboration between the IES and many other organisations which have an interest in lighting matters.

One such body is the Council of Industrial Design, which has already done so much to encourage better design of such things as interior lighting fittings. The CoID intends to stage a special display of domestic lighting in the autumn of 1959. Naturally the equipment shown will only be that which has received the approval of the CoID. We would suggest that every manufacturer of such equipment makes certain that his latest designs are submitted to the Council for inclusion in their Design Index in good time for inclusion in this display. Incidentally, full details of such special displays are made known by the CoID to retailers around the country, many of whom arrange similar displays. This should provide a very good opportunity of giving a much-needed boost to domestic lighting. (The electricity boards might also take this up—it is high time their consumers were shown how cheap good and attractive lighting can be.)

Son et Lumiere

Son et Lumiere is once again in operation at Greenwich every evening except Sundays until October 11. This year the show is being presented on behalf of the Ministry of Works by Atlas Lighting Ltd., who have undertaken to stand any loss (an unlikely event) and to pay any profits to the MoW for improvements to Greenwich Park and the National Maritime Museum. The script has been re-written and the cast is headed by Charles Laughton. (The Henry VIII scenes ought to be realistic enough.) Directional lighting will be from incandescent sources, but all coloured lighting will be from fluorescent lamps.

Street Lighting in London

The Association of Metropolitan Borough Engineers and Surveyors has just issued a booklet entitled "Practice Notes for Street Lighting in London." (Price 5s. per copy, available from the Association at Westminster City Hall, W.C.2.) This booklet is the outcome of the Association's investigations into the practicability of providing a uniform standard of street lighting throughout the metropolitan area. As such it is of interest as the first practical essay in co-operation between neighbouring lighting authorities. We propose to review the document in detail in our next issue, but, in the meantime, thought many readers would like to know that the booklet has appeared. Please don't write to us for copies.



The main entrance lobby of the fabulous Habana Hilton, in Cuba, is lit from above through a series of plastic 'bubbles' set in the domed ceiling. This 30-storey building is unique in that finance for it was provided by the hotel employees—as an investment for the retirement fund of their trade union.



A permanent building for the electrical industry at the.....

Hanover Trade Fair

1 The new building

By John Reid, A.R.I.B.A.

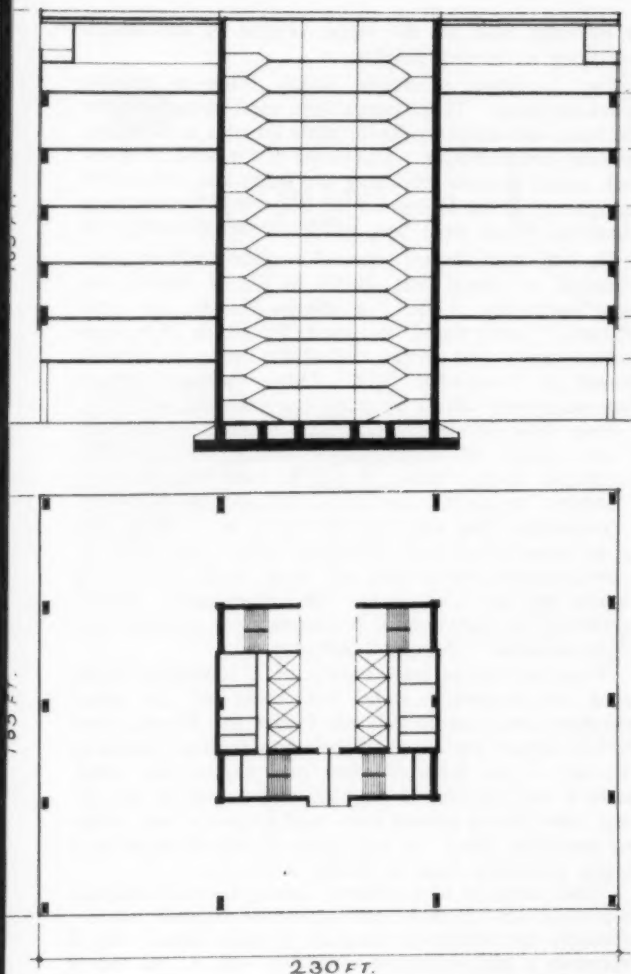
ONE of the first things that the visitor to the German Industries' Fair in Hanover saw this year was a towering new building, visible many miles from the fair-ground. Pale-blue in colour and windowless, it rises 165 ft. from the ground, half as high again as the tallest office buildings in London. This is the home of the German lighting industry; the building was designed exclusively for its use and was erected in six months.

The development of the Hanover Fair is extremely interesting. After the war, when the Fair was started, it was housed in what had once been a light industrial estate. There were about six factory buildings, all of single-bay construction, with the normal daylighting associated with this type of structure. These buildings are satisfactory for exhibition purposes up to a point, but natural lighting is no help in arranging displays and

makes controlled lighting effects impossible. Moreover, buildings which have good natural lighting usually have limitations of shape and size which are in conflict with the best type of exhibition layout.

Thus, when the Fair developed and new buildings had to be added, a different type of building was chosen. Although the new buildings had conventional windows, the ease with which visitors could circulate was considered more important than the natural lighting. Hence, the natural lighting was of little value, and the next logical step in design was the completely windowless building. Several buildings of this type have now been erected—all for use by the electrical industry, though it is the tower block for the lighting industry which is, perhaps, the most significant.

The lighting industry building is devoted to the display of lighting fittings, and is in use only when the Hanover Fair is taking place—i.e., for about ten days each year. The rest of the time the building stands empty, but the project was economically possible—indeed



attractive—because each firm exhibiting does so under a ten-year contract. It was, in fact, cheaper for the firms concerned (and for the authorities) to construct this building, and allow it to spend so much of its life in idleness, than to pay for the construction and removal of temporary stands every year.

The timetable for the design and construction of the building is, in itself, remarkable. Only four weeks were available between the date on which the architects (Brockmann, Hüper, Lichtenhahn and Teerling) received instructions to proceed with the design and the date when the building work had to commence. Thus, during this one month all the planning and paper work had to be accomplished. The building programme stipulated that work should begin on September 1, 1957, and be completed by February 15, 1958. The building was to be available to the exhibition stand-fitters from March 1, 1958. This programme was, in fact, fulfilled.

The design requirements for Hall 12, as the building is known, were that it should form a link between Halls 11 and 13 over the southern entrance to the exhibition ground. A display area of 113,000 sq. ft. was to be provided; each floor was to be arranged so that a visitor making a circuit of a floor must inevitably pass every exhibition stand on that floor; and adequate space was to be provided for passenger and goods lifts, and for the other usual services. Each exhibition space was to be mechanically ventilated, with the possibility of complete air-conditioning, and, finally, there was to be no natural ventilation or natural lighting.

The building complies admirably with all these requirements. It consists essentially of five main exhibition floors, with a central core containing all the lifts and other services. The exhibition floors are about 20 ft. in height, which gives adequate vertical display space, and the core has mezzanine floors between the main floor levels, which are used mainly for cloakrooms, offices, etc.

The building has a reinforced concrete frame and

Opposite, Hall 12, the new home of the German lighting industry, with its textured cladding of shaped metal panels painted pale blue. The white horizontal bands are at normal storey heights and, in the absence of windows, show the scale of the building. The single band of glazing comprises the floor-to-ceiling windows of the restaurant, while there is an open gallery just below roof level. Above, plan and section, the former showing a typical exhibition floor. Right, a view during construction showing clearly the five exhibition floors, 20 ft. apart. At this stage the floor of the mezzanine restaurant was not yet inserted.



floors, with external walls consisting of an outer skin of shaped metal panels on a steel framework and an inner skin of prefabricated insulation panels. The whole of this external cladding is of dry construction, being designed so that it could be fixed from within the building to avoid the use of scaffolding and make work possible in all weathers.

The ventilation system was designed to serve the entire exhibition area, thus allowing maximum flexibility of design for the exhibition stands themselves. The fresh air supplied can be heated or cooled as required, the system being served from a plant room in the link between Halls 12 and 13.

The main mezzanine level of the building comprises a restaurant, which is the only part of the building with natural lighting. Being about 25 ft. above ground level and having floor-to-ceiling windows, this restaurant, when it comes into service next year, will give diners an excellent view of the exhibition grounds.

2 The lighting displays

By R. L. C. Tate

INTERNALLY, the new building of the lighting industry consists, on each floor, of a number of individual stands arranged on either side of a gangway encircling the building. Individual manufacturers are responsible for the design of their own stands, and in almost every instance this year a bewildering array of lighting fittings were hung from the ceilings, giving the effect of an electrical contractor's showroom display. This mass presentation made it rather hard to see the wood for the trees, but I did find a number of fittings which were of interest and which may indicate future trends.

The fittings shown in sketches 1 and 2 were both on the Arbeitskreis stand. The first consists of a pair of 18-in. fluorescent lamps and their starter, suspended by means of a white p.v.c. flexible cable from a pear-shaped ceiling enclosure of polished brass, which contains the choke and capacitor. The lamps are enclosed by an oval wire shade on which is shrunk a nylon-fabric diffuser. Very neatly detailed pierced-brass top and base plates

are provided and, on the stand, several of the fittings were hung at various heights.

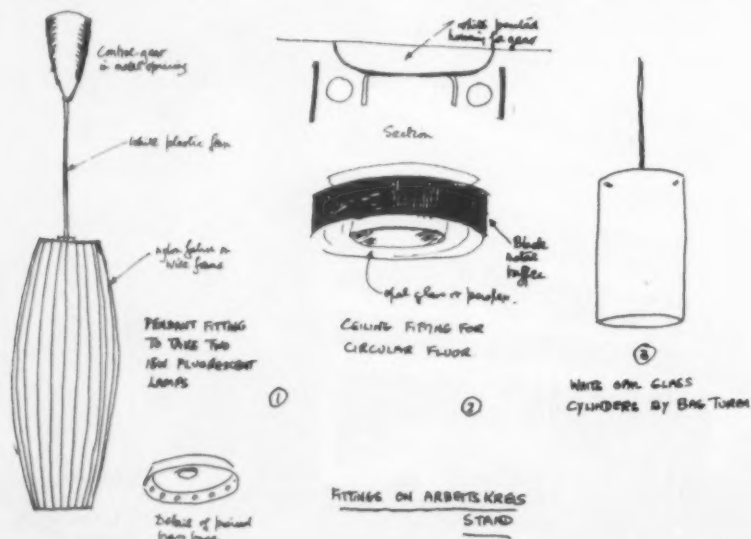
Fig. 2 shows a simple fitting using a circular fluorescent lamp. These lamps were used throughout the exhibition and appear to be far more popular in Germany than they are in Britain. The shape of the perfectly plain black metal cylinder enclosing the lamp was echoed by the majority of the fittings on the Bag Turgi stand, where cylindrical forms were very much to the fore (Fig. 3).

On one stand several types of hospital bedlamp were displayed, of which that shown in Fig. 4 seemed the most interesting. Here, a shutter inside the opal "Perspex" cover could be rotated by means of a large knurled plastic disc on the end of the fitting, to provide upward or downward light. Other bedhead fittings obtained similar effects by more conventional means.

Very little development appears to have taken place in the design of large plastic ceiling diffusers for fluorescent lamps, most of which took the form of "cushions" or continuous rows of diffusers. Butting joints in continuous rows were usually hidden by cover pieces, but in some fittings these appeared to be a very poor fit. A development which does not seem likely to be very popular in the U.K. is the use of eccentric shapes, resembling in plan, coffins, boomerangs or triangles, for ceiling-mounted "Perspex" diffusers.

Tungsten fittings were mostly of a somewhat hackneyed contemporary style, but some of the glass manufacturers, notably Peil and Putzer and Phenix, were offering elegant variations of their now familiar products. The use of two types of glass, one within the other, seems a well-established practice, and in one or two fittings clear ribbed glasses were used to give a very brilliant sparkling effect. A wall-lamp of pierced metal in a simple geometric form is shown in Fig. 5.

There seems to be a tendency among German designers to produce very elaborate, and sometimes tortuous, forms—especially for fittings for tungsten filament lamps. Fig. 6 represents a multi-branched chandelier with, at the end of each arm, a "candle-flame" lamp arranged between a striped glass mirror and a curved piece of "Perspex." (The owner of this stand evidently suspected me of attempted plagiarism, as he warned me off before my sketch was

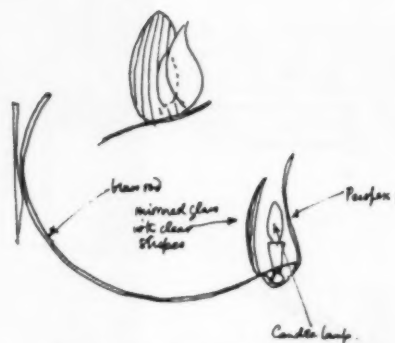


Left, sketches by the author—R. L. C. Tate—showing lighting fittings on the Arbeitskreis stand. Opposite page (top) other fittings displayed in the new lighting industry building; (bottom) display-lighting equipment and techniques used on stands at the Fair.



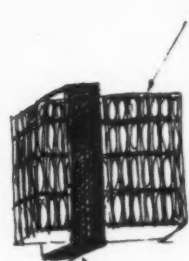
Hospital Bedhead Fitting in Opal
Perforated with internal shelter.

④



ONE ARM OF A DECORATIVE
"CHANDELIER" IN BRASS, GLASS
& PERFORATED

⑤

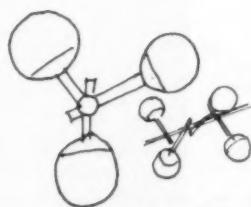


Raised metal
screen.

WALL LIGHT IN
PIERCED METAL
TO TAKE SMALL
FILAMENT LAMP

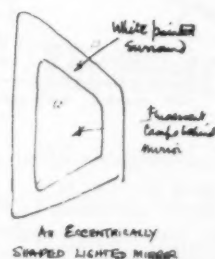
⑥

Solid metal plate



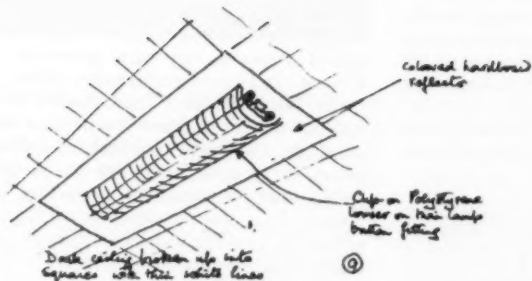
OPAL GLASS SPHERES
ON A CENTRAL SPIRE

⑦



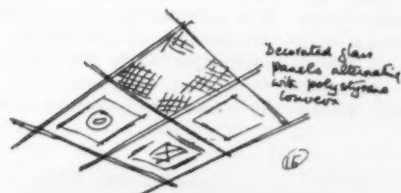
AN ECCENTRICALLY
SHAPED LIGHTED MIRROR

⑧



Dark ceiling broken up into
squares with thin white lines

⑨



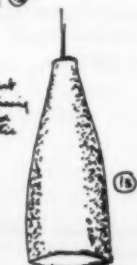
⑩



Small
cylinder in
ceiling



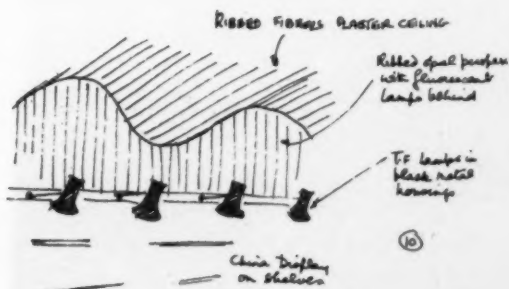
Solid looking housing
for small reflector
lamp in polished
metal, lamp
protruding



An elegant
metal housing
with a plastic
fin

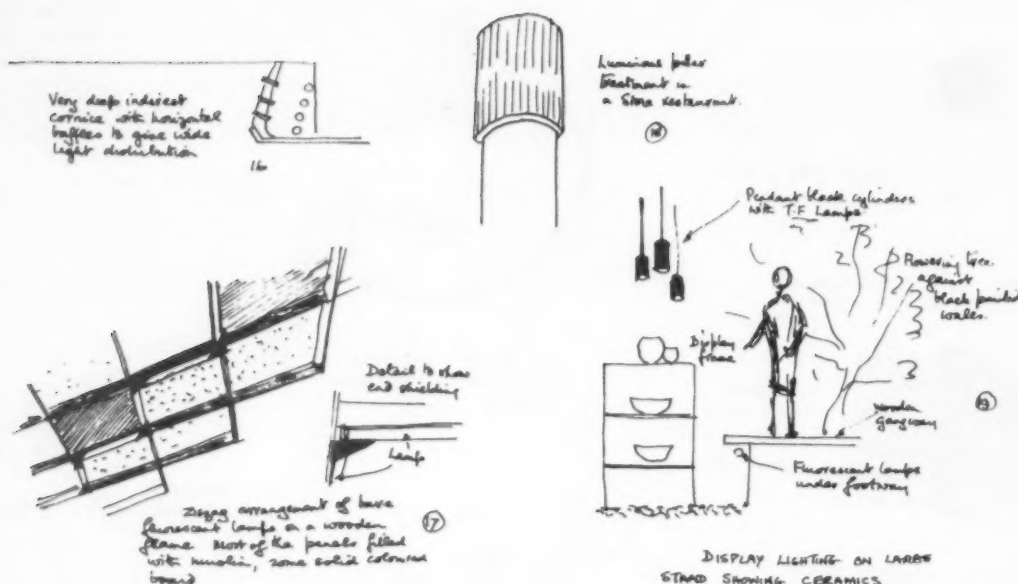
Reflector lamp
protruding from
polished cylinder

⑪



⑫

Chin drifting
on shelves



completed.) Figs. 7 and 8 show somewhat eccentric designs which are not likely to be copied in the U.K.

An interesting development in plastic diffusers is "Lystra"—a white material having good light-diffusing properties and a texture resembling that of a "candlewick" bedspread. Used on tungsten and fluorescent lamps in a variety of shapes, it appears also to have good heat-resisting qualities.

Display lighting techniques in the rest of the Fair, as opposed to the display of lighting fittings themselves, were mainly pedestrian, though a few displays were of interest. In the Messehaus, which is devoted to glass, china, watches and similar luxury goods, several installations were worthy of note. Fig. 9 shows a simple treatment of a bare twin-lamp batten fitting. It is mounted on a pastel-coloured board (on a black ceiling divided into squares by fine white lines) and has a clip-on polystyrene louvre over the lamps.

On another large glass and china stand, a fibrous plaster wavy ceiling was echoed by luminous plastic walls, above

black-painted shelving (Fig. 10). Here, actual light on the display came from small spun-metal reflectors containing tungsten filament lamps. Figs. 11, 12, 13 and 14 illustrate some popular shapes of spun-metal housings for reflector lamps, while Fig. 15 shows the alternate use of acid-etched glass panels and polystyrene louvres supported on a satin-finished brass grille. It is of interest to note that the polystyrene looked very dull and a little "dirty" beside the glass.

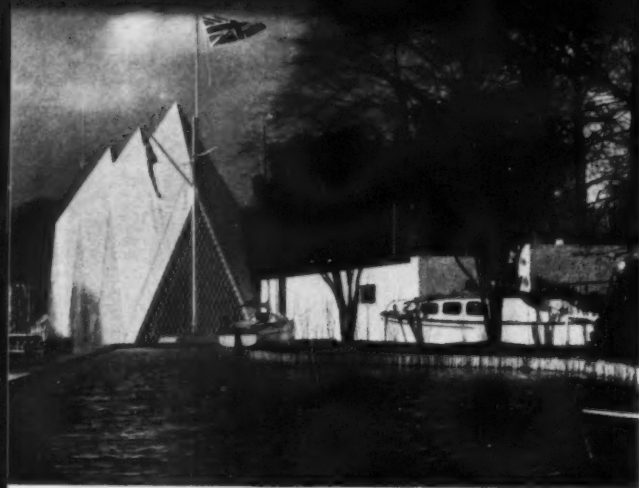
Two simple ceiling treatments—one seen in the Messehaus and the other in the Chemical Pavilion—are illustrated in Figs. 16 and 17. The first is an indirect cornice in which the lamps are arranged in tiers, with baffles to conceal them, giving a very wide distribution of light. The second shows a very neat geometric arrangement of bare 40-watt lamps in a rectangular grille.

In Hanover itself there seems to be little of lighting interest which has not been done before. Considerably more use is made of cold-cathode tubing than in Britain, and in one large store long runs of this tubing are inset in the ceiling over the escalators, providing "leaders" to the upper floors. In a store restaurant intelligent use is made of the pillars to provide luminous fluorescent features to supplement direct tungsten lighting from fittings recessed in the ceiling (Fig. 18).

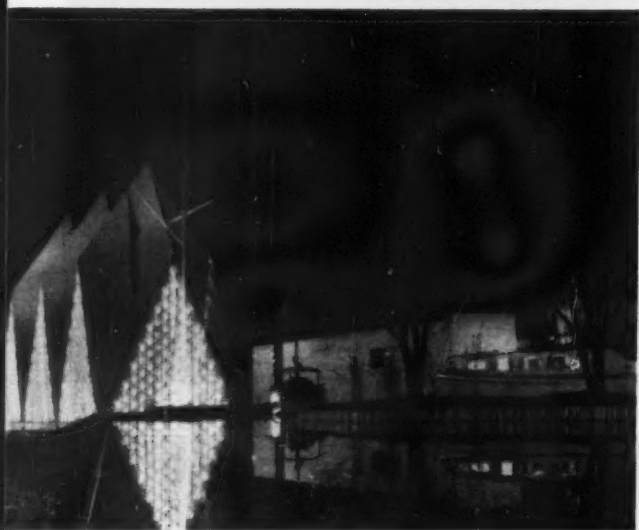
One of the most charming examples of lighting I saw was on a large china and pottery stand on the ground floor of the Messehaus (Fig. 19). The walls and ceiling were painted black, and the merchandise was displayed on spindly metal frames between raised duckboards on which the observers walked. From beneath these gangways, concealed fluorescent tubes lit the under-side of the displays, while clusters of black-painted cylindrical pendants provided top lighting.



Top, more lighting techniques seen at the Fair and in Hanover itself. Left, another view of the lighting industry building.



By day and by night—the British Government pavilion, seen from the south. The entrance is at the far end. At the foot of the page is seen Henry Moore's "Reclining Figure," silhouetted against the patterned wall of the Hall of Technology. The spires of the Hall of Tradition are seen in the background.



Britain at Brussels

An account of the
lighting of the
British contribution to
the Brussels
International Exhibition

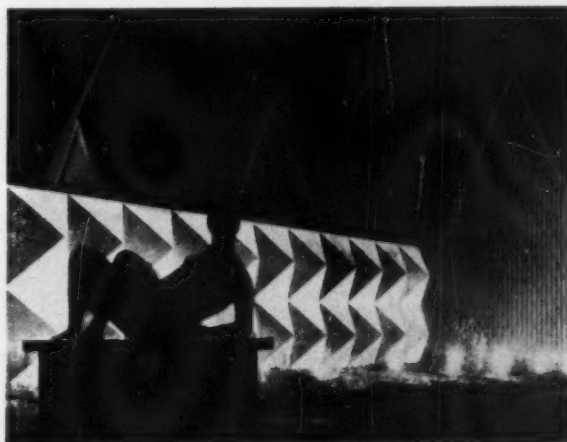
B RITAIN'S contribution to the Brussels Exhibition is in several parts—the British Government pavilion; the British Industry pavilion, including special sections devoted to the City of London and to agriculture; a small cinema; a self-service shop; an ice-cream parlour; two public-houses; and a group of kiosks—one of them a laundrette.

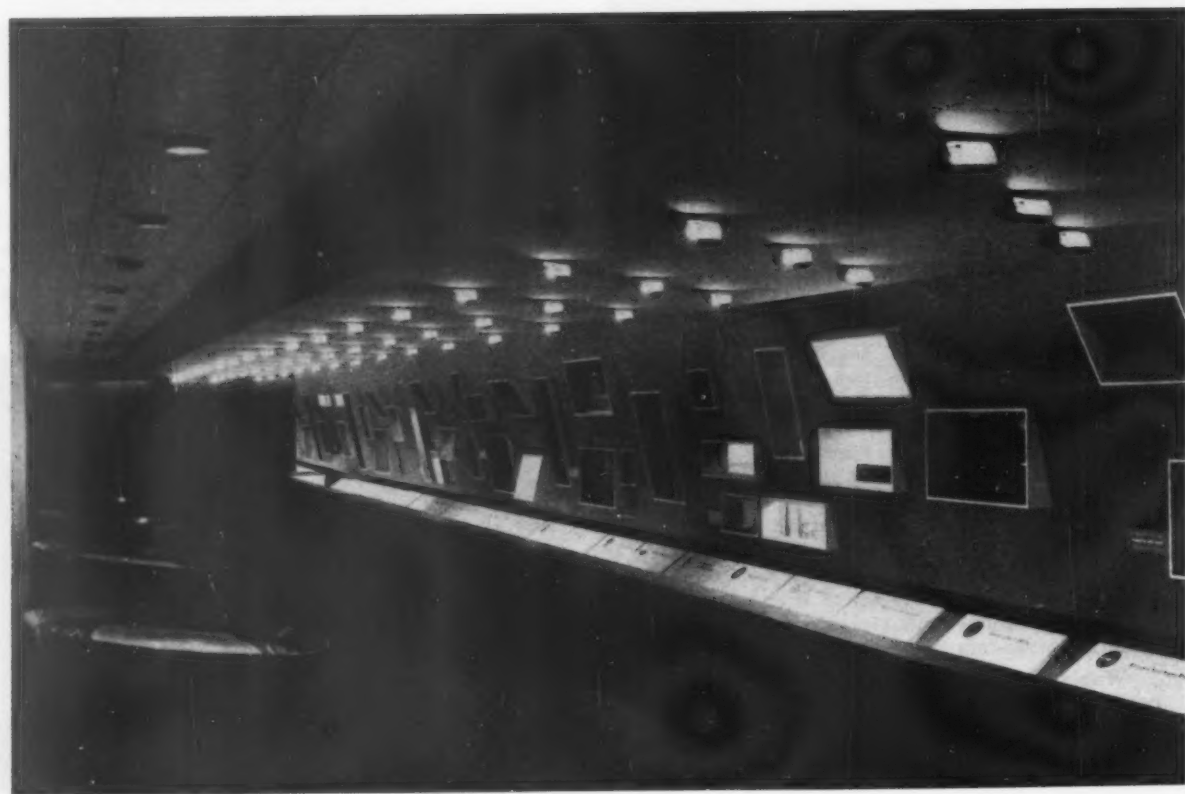
By dividing up the U.K. site in this way, the impact of Britain's effort has, in this writer's opinion, been severely diminished by comparison with that of a number of pavilions on sites of similar dimensions. The main reason for Britain's unique approach to the exhibition was the relatively small sum of money which the British Government was itself willing to spend. And, instead of seeking financial assistance from industry, the Government chose to give over a substantial area of the site to a separate industrial pavilion organised on the lines of a trade fair by the Federation of British Industries. In this pavilion various firms and organisations have rented space on a pro-rata basis.

Within its limitations of size and cost, the Government pavilion may be voted a big success. While some may criticise an excessive emphasis on tradition, there is little doubt that Britain's contribution to scientific and industrial development is well portrayed, and the pavilion is

said to be one of the most popular pavilions at the exhibition.

The British Industry pavilion, on the other hand, though housed in an excellent building, gives a quite unbalanced picture. Determined solely by the decisions of boards of directors up and down the country, the





(Opposite page (top), inside the Hall of Tradition, looking towards the entrance. General illumination level is low and each exhibit is individually lit. Opposite page (bottom), inside the Hall of Technology. Note the low ceiling height compared with the Hall of Tradition and the directional pools of light on the ceiling over the exhibits.

proportions of the floor area devoted to particular industries and individual firms give a totally unreal cross-section of British industry. Some relatively small industries are well represented, while some important industries are not represented at all. More seriously, perhaps, the pavilion fails as an exhibit. While many of the individual stands are extremely well designed, the pavilion is badly overcrowded and only a limited degree of design co-ordination was possible. Thus the total effect cannot compete with the industrial sections of those pavilions where one designer or team of designers was completely responsible for the entire display.

The two pubs are good examples of the best trends in current public-house design and are, in many ways, two of the most successful sections of the British site. The City of London section is of somewhat limited interest; the cinema has a decidedly mediocre interior; and of the ice-cream parlour—a venture of J. Lyons—the less said the better.

British Government Pavilion

The British Government pavilion consists of three parts, through which the visitor must pass in turn—the Crystalline Hall or Hall of Tradition; the Hall of Technology; and a series of courtyards devoted to the Commonwealth, to the Humanities and Arts (including sections on architecture, country pursuits, literature, music, the theatre and “the British at home”) and to British Inventions. This area of the site is linked with the British Industry section by a bridge over the ornamental lake.

The Hall of Tradition is 111 ft. long and 37 ft. wide. The three spires, each 70 ft. high, are made of stressed-skin plywood and are completely self-supporting. The Hall of Technology has, by contrast, a low ceiling—only 12 ft. above floor level—though it is 182 ft. long and 82 ft. wide. It has a light steel framework, walls of cavity blocks, a roof of compressed-straw slabs covered with bituminous felt, and a suspended ceiling of asbestos boarding. Externally, the walls are faced with formed plywood sheets echoing the shape of the spires of the Hall of Tradition.

Much thought was given to the external lighting of these three spires, and into the five most important triangular faces of them are mounted over 4,000 15-watt pigmie lamps—some white, some blue-green—forming attractive patterns of light that can be seen from several of the main thoroughfares of the exhibition grounds. The tops of the spires are floodlit by 1,000-watt “Pageant”

Top right, mural depicting country pursuits in one of the walled courts between the British Government pavilion and the British Industry pavilion. In the background is seen the vertical feature designed by Edward D. Mills and Partners. Right, an exhibit in the Hall of Tradition, with wax figures in ceremonial costumes.





Left, the whimsical Lion and Unicorn courtyard with, on the extreme right, Edward Bawden's pebble-mosaic panel "Coat of Arms." Centre, bridge leading from the walled courtyards of the Government pavilion to the British Industry pavilion, with tile mural by Peggy Angus in background. Turnstiles ensure one-way traffic. Bottom, general view of site, with Henry Moore's "King and Queen" in foreground.

spots emphasising their height and giving a delicate green effect.

The soffit of the main entrance canopy consists of 108 square "Perspex" panels with a "Tudor Rose" design, above each of which a 1,000-watt pearl lamp is concealed, and the V.I.P. pavilion—smaller, but similar in form to the Hall of Tradition—is floodlit in pale green by mirror-reflector units located at the base.

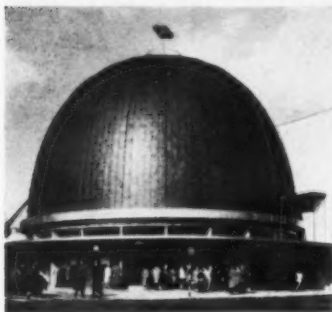
Low-wattage spherical lamps give general lighting to the garden canopy between the Court of Commonwealth and the steps of the bridge leading to the British Industry pavilion, while the steps themselves are lit by circular fittings with prismatic glass covers recessed into an adjacent wall.

Inside the British Government pavilion general and safety lighting has been kept to a minimum, with concentrated high-intensity lighting on the displays. In the Hall of Tradition the only natural lighting, apart from that which penetrates the glass entrance doors, is from coloured-glass eyelets in the sides of the spires that face the road. General artificial light, apart from spilt light from the displays, comes from 17-light chandeliers suspended from the apex of each spire. These fittings carry 60-watt daylight-blue tungsten lamps, covered by cylindrical shades in various colours, and the light, being reflected from the inner faces of the spires, takes on the purple hue with which the spires are painted.

High-level spotlights with cut-off masks light a broad stairway at the south end of the hall, while the stage and its draperies (see photograph at the foot of page 269) are lit by concealed high-power spotlights and by

(text continues on page 275)





The London Planetarium

Architect, George Watt, A.R.I.B.A.;
main contractor, A. J. Wait Ltd.;
electrical installation and lighting fittings,
S. W. Blanshard Ltd.

THERE can be few more exciting and ingenious uses for light than the planetarium, and it was by a happy coincidence that, within a year of the launching of the first man-made satellite, London's first planetarium was opened. This project was originally planned in 1936 but, because of the war, over 20 years were to elapse before it could be realised.

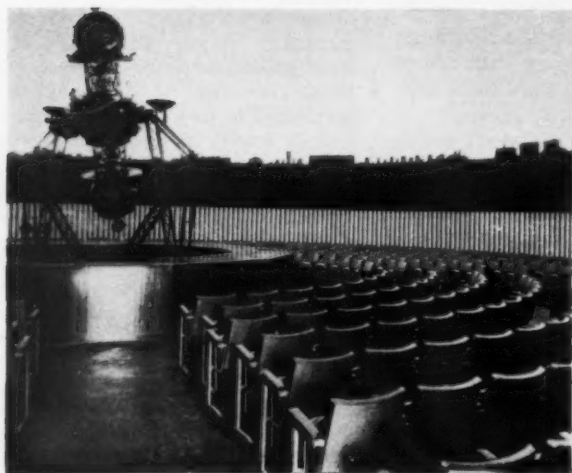
Owned by Madame Tussauds, the planetarium stands on a bomb site adjacent to the waxworks. The site is only just large enough for the 67-ft. dia. dome and the auditorium has, therefore, been placed at first-floor level, with the entrance hall and foyers below. In the centre of this area is a glass-walled enclosure into which the £70,000 Zeiss projector is lowered when not in use, so that it can be seen from the street. Another drawback of the site is that the London Underground runs across one corner, not far below the surface, and to prevent vibration the 2,000-ton structure is carried on a massive concrete raft supported by 48 piles each over 50 ft. deep.

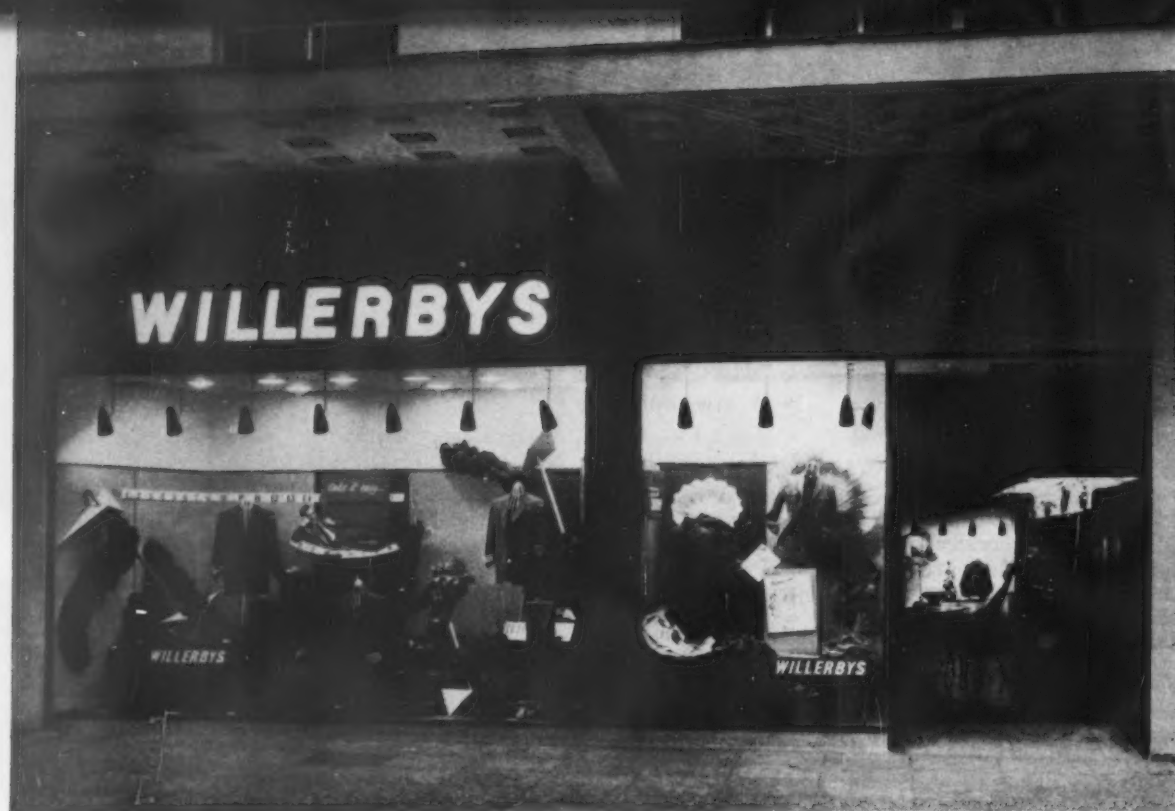
The auditorium is completely air-conditioned, the air within it being under a pressure 2 lb. above atmospheric, to prevent dust particles from reflecting or scattering the beams of light. Sound penetration is prevented by the weight of

the building and by the sandwich structure of the dome, which includes a 3-in. layer of glass fibre between the two concrete shells and a 2-in. layer of cork under the covering of felt and copper sheeting. Inside the auditorium, there is another layer of sound-absorbent material and the surface of the dome—of aluminium sheeting—is perforated to improve the acoustics.

The projector is a "double-headed" machine so that both northern and southern skies can be shown. It projects nearly 5,000 beams of light—the sun, the moon, the planets and 42 of the brightest stars being projected by individual units, while the remaining "naked-eye" stars are projected by means of 32 photographic plates specially prepared by hand. The various projector units, as well as the complete projector, can move in various ways, so that the movements of the planets around the sun can be shown, not only as they appear from the earth but as they would be seen from other points in the universe, while the changing positions of the stars relative to the earth can be demonstrated for any hour of the night, any date during the year, or any time in the past or future. Even the apparent dimming of the stars as they approach the horizon is indicated and special projectors are used for the three variable stars.

Right, ground-floor foyer, lit indirectly by concealed fluorescent lamps and by louvred downlights recessed into the ceiling. The enclosure for the Zeiss projector is on the extreme right. Below, the auditorium, lit between performances by two large projectors housed in the conical-shaped reflectors seen flanking the Zeiss apparatus. Additional lighting comes from lamps concealed by the silhouetted skyline of London.





LIGHTING THE RETAIL STORE..... 1

Willerbys—'wear-while-you-pay' tailors; architects, C. J. Epril, F.R.I.B.A., & Associates

FOUNDED 45 years ago, with its first premises in Lewisham High Street, the firm of Willerbys has become famous as a pioneer of credit tailoring. Right from the start, credit facilities were offered to the firm's customers and to-day, with its 65 branches in London and throughout Great Britain, it is one of the largest companies operating in this field.

The firm sells made-to-measure and ready-made coats and suits for both men and women and, particularly from branches at the naval ports, naval and other uniforms.

Since the war, Willerbys have improved their premises to a remarkable degree and their new shopfronts, interiors and displays set an exceptionally high standard.

The lighting of the firm's branch premises is intended to assist in selling "an idea," as well as the clothes themselves. It must reinforce the "message" of the shopfront and general *décor* and give the passer-by the impression that he is looking at the premises of a firm that makes

clothes for the individual. It must be an indication of the quality of the goods sold within.

Basically, the architects use lighting in three ways: Functionally—to light displays, etc.; generally—for producing dramatic effects, e.g., contrasting areas of light and shade, such as the dark areas between different sales departments; and as a part of the *décor*—i.e., to produce decorative patterns in areas where such effects are more important than the actual illumination levels.

Taking the firm's Oxford Street branch as an example, there is functional lighting to the island display windows, which have egg-crate louvred ceilings with internally-silvered spotlights above. There is no lighting in the lobbies between the display windows, these areas being lit by spilt light from the windows, giving an element of drama due to the contrasting illumination levels. Inside the shop, general lighting comes mainly from tungsten fittings with concentric louvres, recessed into the ceiling, while decorative

effects are produced by the illuminated columns—fluorescent lamps being concealed behind the figured-glass facings—and by opal-glass pendant fittings.

Willerbys, say their architects, are "enlightened clients," more willing than most to venture into the realm of the "contemporary approach." They have found that, for their particular merchandise and sales methods, "it pays its way." The main general principle on which the architects work in designing the lighting is to avoid a 100 per cent. overall density of light. Their aim is to provide contrast and variety.

For the shopfront the lighting must play an integral part in the window displays, to which Willerbys pay particular attention, and must reveal the various cloths to the best advantage. Tungsten lamps are usually used, mainly because of the alleged difficulty in obtaining accurate colour-rendering with fluorescent lamps, but partly because, in the architects' opinion, "fluorescent lighting takes all the third dimension out of the display, so that there

Opposite, shop front of the firm's Bristol branch. Right, inside the Oxford Street branch, looking towards the gents' ready-made department, with fitting rooms on gallery to the right and at rear. Below, view from this gallery looking towards bespoke department and front entrance.

are no shadows and no drama." Nevertheless, fluorescent lamps are sometimes used, particularly when strip lighting is required and, in addition to the permanent window lighting, the architects always provide sockets into which loose spotlights can be plugged by the window-dressers.

Inside the shop, the aims are to provide an adequate level of illumination and to use the lighting as an element of the decorative scheme. Typical decorative techniques developed include fixing a group of reflectors or suspending, at different levels, a group of opal-glass shades around a column. Where ceilings





are high, the architects prefer to use for the general lighting pendant fittings with glass shades, suspended on long flexes. They find that, in this way, they can use effectively quite inexpensive fittings. They do not usually use fittings recessed into the ceiling, although at Oxford Street, as mentioned above, this arrangement was adopted because

the shop is at two levels: thus, pendant fittings in the low-level areas would have been at the eye-level of customers in the high-level areas.

For displays inside the shop—mainly displays of cloth—architectural striplights are used. For example, a display box cantilevered from the wall is lit either by lamps

Left, the shop front of the new Oxford Street branch. Below, one of the fitting rooms at this branch. At foot of page, ladies' department on split-level first floor of Southampton branch looking across the staircase well.



concealed by a pelmet suspended from the ceiling or by lamps concealed within the display box itself.

As a result of their preference for tungsten lighting, the architects have, on occasion, experienced difficulties due to over-heating, and have found that the design of some opal-glass shades does not allow heat from the lamps to escape.

Fascia signs outside Willerbys shops usually consist of the firm's name in letters internally lit by neon tubing, with faces of white "Perspex" and sides of black "Perspex." At the firm's latest premises, however, the trend is to eliminate the fascia altogether and to have instead only a suspended name sign, as at the Oxford Street branch, where the letters are fret-cut, instead of being affixed.

Right, interior of Bristol branch, looking through gents' department towards ladies' department at rear.



BRITAIN AT BRUSSELS

continued from page 270

a continuous row of fluorescent lamps at the rear. Displays are individually lit by tungsten mirror reflectors, by hot-cathode fluorescent lamps and by ultra-violet units.

In the Hall of Technology a certain amount of daylight filters through coloured "Perspex" louvres in the outside walls. General and safety lighting is by semi-recessed ceiling fittings housing 25-watt tungsten lamps and fitted with "spill rings" to give light to the public walkways. In addition, a large number of ceiling-mounted fittings housing 25-watt pearl lamps throw elliptical spots of light on to the low ceiling in the direction in which visitors walk through the hall. Among the exhibits are several in the form of colour transparencies lit from the rear by fluorescent lamps, while in the British People section there are 26 continuously-operating back projectors showing colour films, each using a 750-watt projector lamp.

British Industry Pavilion

The British Industry pavilion consists of a rectangular building, 60,000 sq. ft. in area, surrounded on all sides by glass curtain walling. The roof is in the form of six giant and inter-connecting steel-framed "mushrooms," each supported by a lattice-steel "stalk." Although the design of the building is intended to indicate a structure suitable for industrial use, the lighting was designed solely for the present application of the building as an exhibition hall.

The system used—indirect lighting from fluorescent lamps—was chosen from designs put forward by a number of lighting manufacturers working within a budget limit of £5,000. Its function is to emphasise the form

of the building and to supplement the lighting of the individual exhibitors' displays. The whole of the underside of the roof is lit, but there is no direct downward light, so that the effect is to produce a glowing surface to the white-finished corrugated-aluminium roofing and to pick out the main structural members, which are painted blue-grey.

The fluorescent lamps and instant-start control gear are housed in small-section sheet-steel troughing with a dark-grey painted finish. This troughing is arranged around the "mushrooms" at four levels, the total length at each level varying from 16 ft. for the troughs closest to the floor to 320 ft. for the troughs nearest the roof. Eight-foot warm-white lamps are used, except where the straight-line length of troughing is sufficient only for 4-ft. or 5-ft. lamps. The lighting load is in the region of 50kw., and the illumination level produced by this general-lighting scheme is approximately 7 lm/ft².

An important feature of the British Industry pavilion is the name sign outside. Mounted on a red metal panel 65 ft. long and 5 ft. high, this comprises 3-ft.-high letters internally lit by double outlining of white fluorescent tubing operating at 60mA. The letters have faces of white "Perspex" and sides of black metal.

Designers and Contractors

Co-ordinating architects for the British section of the exhibition and architects for the British Government pavilion, Howard V. Lobb and Partners. Co-ordinating designer and display designer for the British Government pavilion, James Gardner, O.B.E., R.D.I. Electrical installation, Troughton and Young Ltd.

British Industry pavilion: Architects, Edward D. Mills and Partners; electrical consultants and contractors, James Kilpatrick and Son Ltd.; lighting of main pavilion, A.E.I. Lamp and Lighting Co. Ltd.; illuminated sign, Pearce Signs Ltd.



City of Birmingham Museum and Art Gallery

Re-opening of the Feeney Galleries

THE Birmingham City Museum and Art Gallery was opened in 1885. Through the generosity of the late Mr. John Feeney, 10 new picture galleries were added in 1919. Six of these galleries, destroyed by a bomb in 1940, were recently rebuilt, four in their original form, one to serve as a café and picture-storage area and one as a small gallery for watercolours, with a mezzanine floor above for offices, workroom and stores. The work of rebuilding was carried out in three stages, extending over a period of two and a half years, at an estimated cost of over £162,000.

To maintain the classical character of the building, the walls and roofs had to be kept to the original height and outline, but within this shell, enlarged

cornice coves and a central suspended ceiling or valarium at roughly half the true eaves height were provided. (Gallery I had a different cross-section and special treatment was devised for it.)

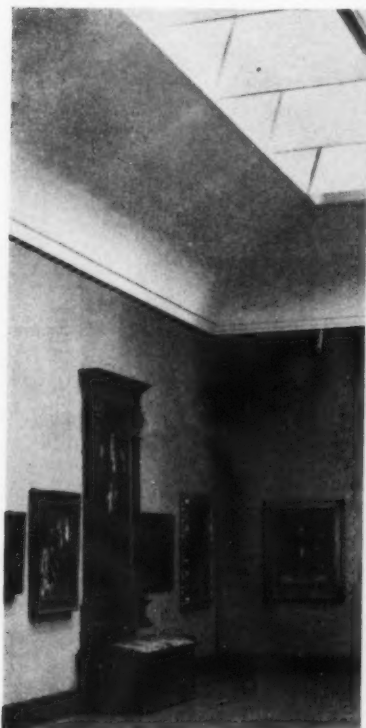
The principles on which the daylighting is based were evolved by officers of B.R.S., working in close collaboration with the City Architect's department, which was responsible for all constructional details. The basic research work was carried out by Mr. John Bickerdike, A.R.I.B.A., and scale models were used to ensure that the design principles were sound.

In general it was decided that the portion of wall on which the pictures were to be hung should be the most brightly lit area in the room. A height

of 5 ft. 6 in. was chosen as the critical eye-level and the section was designed to give the maximum daylight at this height, with the intensity falling away evenly above and below.

For artificial lighting, the aim was to reproduce, as closely as possible, the daylight conditions. Specially-designed fluorescent fittings mounted on the valarium edge, with supplementary tungsten fittings restoring the missing red element of light, go far towards achieving this aim.

The valariums are hung from the roof trusses by steel rods and longitudinal lattice beams at a height of 12 ft. 6 in. above floor level. Transverse booms, with free upswept ends, carry plastic egg-crate louvres, forming a continuous horizontal panel 13 ft.



Above, part of Gallery I, in which are displayed paintings of the Italian school. Above, right, plastic laylight in this gallery, to the louvres of which fluorescent units are fixed.



wide, while suspended above the up-swept ends of these booms, on either side of the gallery, are giant louvre blades which increase the daylighting of the paintings and cut out most of the remaining view of the sky. In Gallery I the lighting is concealed by a high-level continuous laylight, with deep ribs and a corrugated plastic infilling.

Recent advances in picture-gallery design are not limited to the distribution of light, but include also developments in the use of colour and in

methods of hanging the pictures. A neat method of concealed picture-mounting is used in all these galleries. Circular two-pin slotted mounting discs are secured with steel pins to the fabric wall finish and projecting screws from the backs of the pictures are then fitted into the rebated slots. The pins are long enough to drive through the wall covering and into the softwood backing, yet thin enough to pass through the weave of the fabric without cutting the threads.

The heating system in the galleries consists of hot-water coils embedded in the concrete floor screed, which is finished with cork tiling. This system eliminates the traditional central bank of radiators surrounded by built-in seats and makes possible a much more open arrangement of seating.

Daylighting in the café is through laylight panels, which form the greater part of the false ceiling over this area, interspersed with opaque panels pierced to house concealed lighting fittings which shine downwards through concentric star-pierced louvres.

Architect, A. G. Sheppard Fidler, M.A., B.Arch., F.R.I.B.A., A.M.T.P.I. (City Architect); consulting engineer (for structure, heating and ventilation, and lighting), Sir Herbert J. Manzoni, C.B.E., M.I.C.E. (City Engineer and Surveyor); lighting installation, Etna Heating and Lighting Co. Ltd.; lighting fittings, General Electric Co. Ltd., Harris and Sheldon (Electrical) Ltd., Luminated Ceilings Ltd., and Osler & Faraday Ltd.



Left, Gallery XVI—one of the main galleries. Opposite page, ceiling and superstructure in Gallery XV, showing general lighting fittings above the egg-crate laylight, with fluorescent and tungsten units fixed along the edge for the direct lighting of the paintings.

Salisbury

Cathedral

Floodlighting

By S. G. H. HODDINOTT



Salisbury Cathedral, which was consecrated in 1258, is this year celebrating its seventh century, and has been floodlit for the occasion.

The setting of the cathedral is one of the most beautiful in Britain. It is surrounded by a magnificent green and Close, and so situated in a valley that the tower and the 404-ft.-high spire can be seen for miles around.

Throughout the centuries the spire has been a symbol, and it was therefore decided that it should be the focal point when the building was floodlit and that it should be emphasised by greater brightness than the rest of the cathedral. This decision, while easily made, was less easy to implement due to the great height of the spire and the extent of the green on three sides of the cathedral.

In order to reduce the waste-light factor to a minimum, it was necessary to use a floodlight with as narrow a beam as practicable, and of compact design and small size—the latter because of the considerable number of units required for each main bank; high-tower floodlights having a main beam angle of 23 deg. were selected.

Due to obstructions in line with the four faces of

the tower, it was necessary to project to the corners, and this, of course, helped to give wider coverage. The north-east and north-west sitings are in banks of ten 1,500-watt projectors at ground level; the south-east bank is split into one of six units and another of four, the tower section being more to the south to project up between two low-level obstructions; the south-west bank is positioned on the west cloister roof to avoid a large tree in the centre of the cloisters.

To calculate the number of floodlights to each bank, brightness levels, taking into account the reflection factor of the stonework, were predetermined at set vertical intervals. In theory it would have been possible to obtain the same brightness at the top of the spire as at the base of the tower, but this would have involved considerable waste of light and a much higher electrical load. The brightness does therefore taper off slightly up the spire.

Of the 60 kw. projected, 18 kw. were used to light the 100-ft. tower and the remaining 42 kw. the narrow, tapering 200-ft. spire.

As the large area of green surrounding the cathedral



is used by the public during the summer months, it was necessary to site the projectors lighting the fabric as far back as possible. As the public would be able to view the cathedral from three sides it was important to avoid glare. Low-surface-brightness projectors with a narrow vertical and wide horizontal throw were therefore used. A combination of clear and bowl-frosted lamps are used to get the best results from the Chilmark stone from which the cathedral is built. This stone is lichen-covered in places and has aged to a colour which varies with the weather. In wet weather it darkens and is not an easy subject to floodlight.

The east and north faces are covered by 41 low-brightness projectors; the west front is lit by nine narrow-beam projectors. All projectors house 1,500-watt lamps giving a total loading for the main fabric of 75 kw. The south face is not lit. The load for the whole building is 135 kw.

Approximately four miles of cable of varying sizes

were installed. It was fortunate that the Southern Electricity Board, with instances such as this in mind, had had the foresight to install a sub-station within the precincts of the Close. From this a permanent main cable was fed to the control point in the north-west corner of the green. Switching is by time-clock operating a 300-amp triple-pole contactor feeding into a multi-way switched fuse which in turn feeds the sub-distribution points.

In view of the temporary nature of the floodlighting PVC-covered cable is laid in a shallow trench beneath the turf. Small wooden boxes on legs (christened "beehives") house fixed 13-amp plugs and sockets for the individual floodlight feeds. The floodlights for the tower and spire were mounted on triangular Dexion frames laid on the ground. The larger area floodlights were fixed in banks of four or five to wooden plinths at 60-ft. intervals and pegged to the ground by 2-ft. wooden stakes.

The installation was carried out by the Southern Electricity Board and lamps and floodlights were provided by the AEI Lamp and Lighting Co., Ltd.

Lighting Abstracts

OPTICS AND PHOTOMETRY

- 585. Guide for photometric testing of searchlights.** 535.24
Illum. Engng., **53**, 155-162 (Mar., 1958).

Prepared by a sub-committee of the American IES, this Guide deals exhaustively with the photometric testing of searchlights having a total beam spread (divergence) of less than 10 deg. Particulars are given of minimum range lengths, range location and the corrections for stray light and atmospheric losses. The goniometer and associated photometric instruments are referred to, and details are given of various techniques for the correct alignment and focusing of searchlight optical systems.

P. P.

- 535.6 : 628.975
586. Colours and colour limits for light signals for traffic control.

P. JAINSKI, *Lichttechnik*, **10**, 183-189 (Apr., 1958). In German.

The author first explains that in different signalling systems different numbers of colours, up to five, are employed and this naturally affects the ease with which the various colours can be distinguished. He describes the CIE system of limits defined by boundary lines on a colour chart and explains why, for some colours, it is necessary to have more than one set of limits, each of them appropriate to certain conditions of use. In the German standard the limits are not always the same as those defined by the CIE but are never outside them. The author discusses, for each of the five colours in turn, the limits adopted for different classes of traffic. He concludes with a consideration of the effect of background luminance.

J. W. T. W.

- 612.843.367
587. Discomfort glare at low adaptation levels. Part III—Multiple sources.

R. C. PUTNAM and K. D. BOWER, *Illum. Engng.*, **53**, 174-180 (Apr., 1958).

Further investigations at the Case Institute of Technology of the discomfort produced by glaring light sources at low adaptation levels have included a second study of the effect of angular position of a source in relation to the direction of viewing and an examination of the "additivity" of glare discomfort from a number of sources simultaneously exposed to view. The relationship between angular position and source sensation luminance (BCD) was found to change as the background luminance was increased from 0.01 to 0.1 foot-lamberts. BCD was also found to increase nearly linearly with the number of sources present, but a pronounced departure from direct additivity was noted when two of the three sources were located near the periphery of the visual field.

P. P.

- 535.24
588. Photometer for measurement of effective intensity of condenser-discharge lights.

C. A. DOUGLAS, *Illum. Engng.*, **53**, 205-208 (Apr., 1958). Conventional methods for measuring the effective intensity of condenser-discharge light sources are time consuming, particularly when the distribution of effective intensity from a projector system is required. A photo-electric photometer has accordingly been developed which will both measure the effective intensity distribution and record it automatically. The theory of the photometric integration is discussed and some test results are reproduced.

P. P.

LAMPS AND FITTINGS

- 621.327.534.15
589. Present state of starterless control gear for fluorescent lamps.

C. H. STURM, *Lichttechnik*, **10**, 109-113 (Mar., 1958). In German.

The use of fluorescent lamps in circuits which avoid the use of a starter has developed greatly during the past few years and there are now a large number of such circuits, some of them likely to produce effects which seriously reduce the life of the lamp. For example, the lamp may be repeatedly started before the electrodes reach a sufficiently high temperature, or the wave form of the lamp current may be so distorted that the ratio of peak to r.m.s. value is very high. The author gives a very complete account of many of the circuits which have been used and states their advantages and disadvantages.

J. W. T. W.

- 621.326
590. Lamps for aircraft lighting.

Illum. Engng., **53**, 211-212 (Apr., 1958).

Prepared by the Aviation Lamps Sub-committee of the American IES, this Recommended Practice, which supersedes one published in 1950, lists most of the lamps now available or used in United States aircraft lighting. The table groups lamps by type of use, and gives particulars of dimensions and electrical operating characteristics as well as Service and trade numbers.

P. P.

- 628.971.6
591. Analysis of light distributions from linear source street luminaires.

R. G. MCPHAIL, *Illum. Engng.*, **53**, 193-197 (Apr., 1958).

The conventional circular co-ordinate system of cones of maximum candlepower, although suitable for symmetric light sources, does not readily lend itself to linear sources producing rectangular rather than circular distributions. An alternative system is developed which is particularly suited to street lighting calculations with linear source luminaires. Discrepancies arise in interpreting the American Standard Practice for Street and Highway lighting when linear sources are considered, and suggestions are offered for amplifying the Standard Practice to accommodate rectangular light distributions.

P. P.

- 621.32
592. Electroluminescence.

D. W. G. BALLANTYNE, *Wireless World*, **63**, 128 (Mar., 1957).

The electroluminescent phenomenon is explained simply, and a method for constructing electroluminescent panels is given. The application to visual displays (television) and to storage devices for computing is described.

R. G. H.

621.326

- 593. Smaller, more efficient 100-watt incandescent lamps.**

P. B. JORDAN, C. W. PEARSON and W. H. FISHER, *Illum. Engng.*, **53**, 121-127 (Mar., 1958).

By placing the coiled-coil filament of a 100-watt general service lamp along rather than across the lamp axis, the pattern of filament radiation and filling-gas convection currents becomes so altered as to produce a six per cent. greater mean light output and an 11-deg. C. lower lamp can temperature in the same bulb size. The latter advantage has enabled the bulb size to be reduced to 2½-in. diameter by 4 7/16 in. overall length. A three-bulb floor or table light employing the new lamp is described.

P. P.

LIGHTING

- 594. Guide for measuring and reporting daylight illumination.** 628.92
Illum. Engng., **53**, 213-216 (Apr., 1958).
 Prepared by the Daylighting Subcommittee of the American IES, this Guide indicates the measurements to be obtained when making a systematic evaluation of the daylighting design of a building interior. The exterior and interior photometric quantities to be measured are listed and notes are given on the test equipment and procedure to be used. A sample test report is reproduced and some suggestions are given on its compilation. P. P.
- 595. Practical daylighting prediction.** 628.92
 J. W. GRIFFITH, W. J. ARNER and O. F. WENZLER, *Illum. Engng.*, **53**, 185-190 (Apr., 1958).
 The "lumen" method of daylighting prediction, developed at the Southern Methodist University, Texas, has been further developed to enable the data to be presented in tabular form. The maximum, mid-point and minimum working plane illuminations are derived from two simple calculations, one for light received from an overcast, uniform or clear sky and the other for light received by reflection from the ground. Each calculation requires a knowledge of a coefficient of utilization and a ceiling-width factor, their values for given room sizes and wall reflectances being obtained from the tables. P. P.
- 596. Daylight plus electric light—In schools.** 628.972
 H. S. GREGORY, *Illum. Engng.*, **53**, 191-192 (Apr., 1958).
 To offset excessive daylighting contrasts due to the large windows in Bogalusa High School, Louisiana, permanent supplementary artificial lighting has been installed. In the library, the dark sections between the rooflights and side windows are illuminated by artificial skylights giving 80 lm/ft². In the home economics room, where the diversity of daylight illumination was 150-200 lm/ft² near the windows to 8 lm/ft² at the centre of the room, supplementary artificial lighting to a level of 50 lm/ft² has been provided. P. P.
- 597. Light and colour in industry.** 628.9
 E. HELLERN, *Ljuskultur*, **30**, 5-9 (Jan.-Mar., 1958). In Norwegian.
 The daylighting of industrial buildings is discussed, and different types of roof-light, including the BRS monitor roof and various systems which exclude direct sunlight. Care must be taken in the choice and placing of fluorescent lighting, enabling it to conform to the roof construction. Experience of colour in factories is limited in Norway, but the use of the British Standard 2660 should prove interesting. R. G. H.
- 598. Light on Foresta.** 628.972
 C. B. HOLMBERG, *Ljuskultur*, **30**, 11-14 (Jan.-Mar., 1958). In Swedish.
 Foresta is a famous social centre in Stockholm which has now been modernised as a luxury hotel. The lighting is illustrated by photographs. Great play has been made of inset ceiling lighting. R. G. H.
- 599. Office lighting with new fittings.** 628.977
 L. STARBY, *Ljuskultur*, **30**, 19-20 (Jan.-Mar., 1958). In Swedish.
 A drawing office has been lit with lighting units each containing three 40-watt fluorescent lamps, of which two are reflector types directing the light on to the drawing-boards. The fittings are mounted over the window, and the light flux is directed on to the working plane from essentially the same direction as that of the daylight. Some light is allowed to fall on the curtains and ceiling to create a good brightness pattern. R. G. H.
- 600. Street lighting in different environments.** 628.971.6
 P. SANDGREN, *Ljuskultur*, **30**, 21-25 (Jan.-Mar., 1958). In Swedish.
 Opinions on the best light source for street lighting are very definite and very different. One thing is certain, the tungsten filament lamp has been displaced by modern discharge lamps, tubular fluorescent or otherwise. Examples are given of modern street lighting in Switzerland, France, Holland and Germany. Attention is drawn to the different designs of column, especially those designed in Germany. Although methods and sources differ in the countries studied, the main aim is the same, to put more light on the street surface. R. G. H.
- 601. Interreflections in asymmetrical rooms.** 628.93
 P. F. O'BRIEN, *Illum. Engng.*, **53**, 131-136 (Mar., 1958).
 The predetermination of luminance and illumination distributions in rooms with luminous surfaces becomes difficult to effect by calculations when the luminaires and surface reflectances are not axially symmetrical. A Luminous Analogue Computer has been constructed at the University of California to assist in the rapid solution of such types of lighting problem. Examples of the results obtained from the Computer are given for a cubical room and for a long room combining daylighting and a luminous skylight. P. P.
- 602. Allowance for the depreciation in illumination during service when designing to German standard 5035.** 628.93
 E. WITTIG, *Lichttechnik*, **10**, 181-183 (Apr., 1958). In German.
 The German standard DIN 5035 provides that when the illumination of an interior has fallen to 70 per cent. of the prescribed value the installation should be attended to. If the maintenance factor is as low as 0.35 it follows that the initial illumination must be double the prescribed value. The author suggests that the initial value should be such that it and the final value differ equally from the prescribed value, so that if, as laid down in DIN 5035, the final value is 70 per cent., the initial value should be 130 per cent. of the prescribed value and the maintenance period should be arranged accordingly. The author discusses other proposals that have been made, particularly in America, taking into account the plan followed for lamp replacement. J. W. T. W.
- 603. Investigations with models.** 628.93
Bygghästen, **36**, 29 (Nr. A4, Apr., 1957). In Swedish.
 An illustrated description is given of lighting investigations being undertaken at Princeton University School of Architecture with the aid of scale models. Among the apparatus in use is a heliodon and a transparent plastic hemisphere in which the models can be studied under the natural sky, protected from the weather. The studies are being extended to cover climatic conditions also, and the conclusion has been reached that a building in the temperate NE zone of the USA should have a ratio of 1 to 1.6 for the short to the long wall, orientated 17.5 deg. east of south. This orientation gives the greatest gain of solar radiation in winter, and avoids excessive insulation in summer. R. G. H.

NEW PRODUCTS

Tungsten lamp fittings

The Merchant Adventurers Ltd. have recently introduced a new series of lighting fittings, known as the "Ellipse" and designed by Paul Boissevain.

The main feature of the "Ellipse" series is the slimmness of the white opal glasses which appear to be less deep than they are, whilst their elliptical shape provides low apparent brightness from normal angles of vision. The metalwork is in 16-gauge aluminium, anodised satin silver or pale gold, and the construction is simple, effective and foolproof, no screws or levers being used to secure the glass.

Five sizes of glass from 10 to 22 in. in diameter are available either totally enclosed or with louvred apertures. These are used with alternative mountings (recessed, flush to ceiling, off-ceiling, wall bracket, tube pendant and cord pendant) designed in two forms for use with vertical or horizontal lamps up to 300 watts. In addition, reflectors from 16 to 32 in. in diameter, finished in a range of stove enamelled colours, provide an extension to the basic range, which numbers 120 units in all.

Fluorescent surface fitting

The AEI Lamp and Lighting Co. Ltd. has introduced a new shallow-type surface diffuser fitting for use with low ceilings in shops, halls, offices and other commercial interiors where appearance and low surface brightness are important. The fitting consists of a bonderised sheet steel box, exterior finished in black, and either an opal polystyrene louvre or a "Perspex" diffusing panel. The control gear for the four 4-ft. 40-watt fluorescent lamps is contained at both ends of the fitting, which has detachable end plates to assist maintenance and to facilitate the removal of the louvre or the diffusing panel.

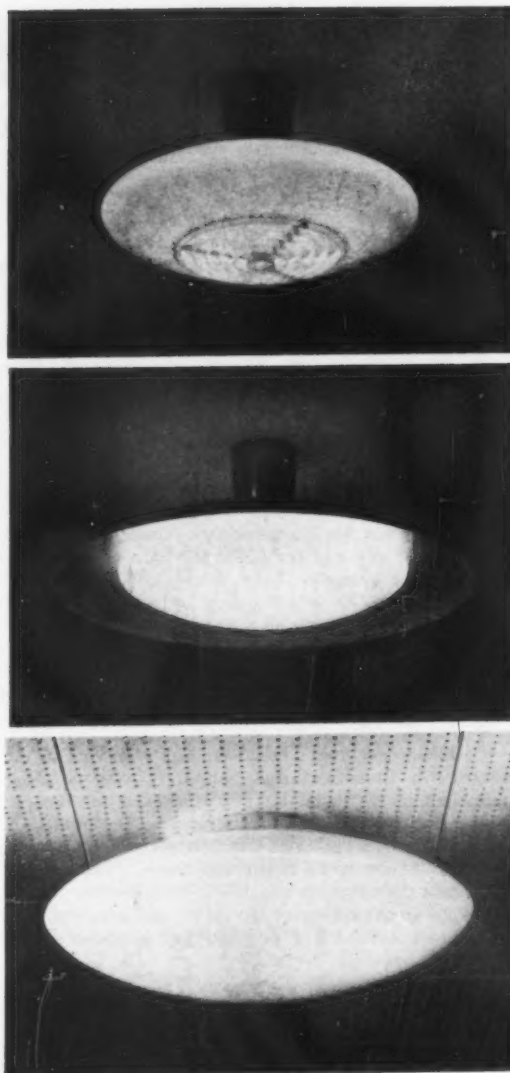
Tower ladder for Group 'B' lighting

The latest tower ladder manufactured by John Gibson & Son Ltd., of Jameson Place, Leith, Edinburgh, can be fitted on a 15-cwt. pick-up or truck and is intended for work on Group "B" installations. A one-section framework is used and a fixed platform is provided. Platform heights of 10 ft. 6 in., 11 ft. 1 in., and 13 ft. are possible. The framework is fabricated from specially extruded aluminium sections and access to the platform is by rungs at the rear of the framework. The tower ladder is mounted forward on the vehicle leaving ample clear space for spare lamps, fittings, tools, etc. Prices are: Mark I, £95; Mark II, £99; and Mark III, £104.

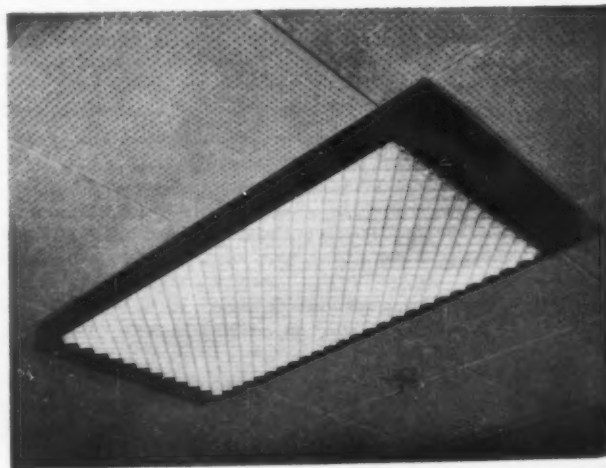


(Left). Loblite opal glass ceiling fitting using lamps up to 200-watt. The additional lampholder for a 25- or 40-watt candle lamp for emergency lighting is optional.

(Right). AEI surface diffuser fitting.



Three of the Merchant Adventurers' "Ellipse" series; top, off-ceiling with louvred aperture; centre, off-ceiling with reflector; bottom, flush to ceiling.





Rotaflex table lamps.

Table Lamps

Rotaflex (Great Britain) Ltd. have just introduced a number of new designs of table and standard lamps and wall brackets designed by John and Sylvia Reid. Many of these are in the now familiar formed cellulose acetate, but several are of metal, either plain or pierced. The illustration shows three table lamps which are available with shades in white, yellow, red and black. The price of each is £3 9s. 11d. including tax. Matching wall brackets are also made.

INSTALLATIONS

Banks

The illustrations in the facing column show two branches of Barclays Bank; one a rebuilt and modernised bank at Leicester and the other in the new 14-storey building in High Street, Birmingham.

In the main hall of the Leicester branch specially designed fluorescent cornice fittings are mounted in four continuous 22 ft. runs under the central dome. Each run houses four 5 ft. 80-watt warm white lamps behind opal "Perspex" panels. Downward lighting is provided by a reflector system behind the lamps which also throws some light on to the ceiling.

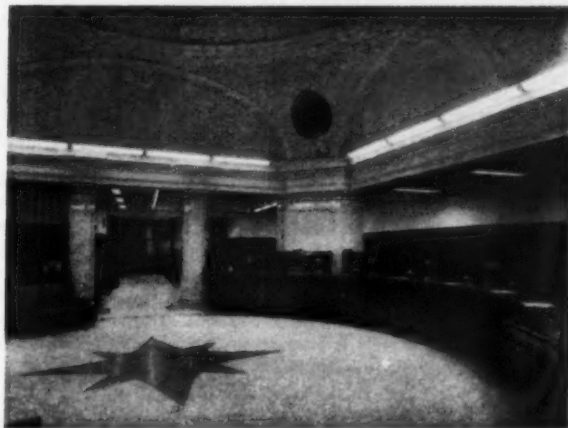
The public part of the hall in the Birmingham branch is lit by two rows of nine twin-lamp 6 ft. x 2 ft. "Module" fluorescent lighting fittings in a midnight blue Burgess acoustic ceiling. A blend of deluxe warm white and warm white fluorescent lamps is used to provide the desired colour rendering and to emphasise the natural beauty of the marble, leathercloth and other materials used.

The lighting intensity over the whole of the public space and the counter area is 40 lm/ft² which has been increased to between 45 and 50 lm/ft² on the clerks' side of the main counter by locally-mounted individually-switched 4 ft. fluorescent fittings.

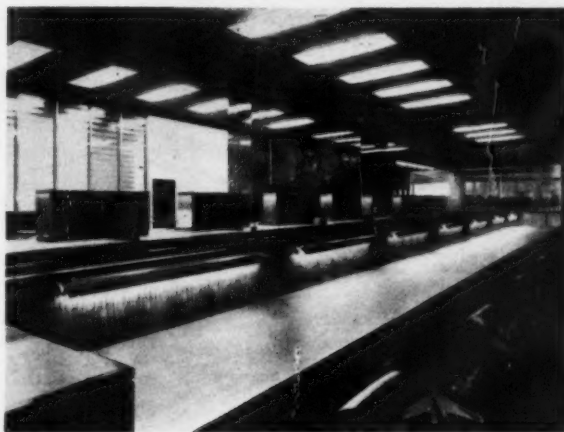
In the manager's and assistant manager's rooms a light well has been fitted with a false ceiling of acid-stippled plate glass. Batten fittings using warm white and daylight lamps are mounted above the glass and can be switched on as required to supplement daylight. Recessed tungsten fittings with stepped glass diffusers are mounted into a ceiling raft at one end of the manager's room.

The architects for the Leicester branch were F. J. Lenton and Partners and the electrical installation was by T. H. Wathes and Co., Ltd. The architect for the Birmingham

branch was R. J. A. Gazzard; the shop-fitters were Harris and Sheldon Ltd. and the installation by Etna Lighting and Heating Co., Ltd. The lighting equipment for both branches was supplied by the AEI Lamp and Lighting Co., Ltd.



Main hall of the Gallowtree branch of Barclays Bank, Leicester.



Main hall of Barclays new branch at High Street, Birmingham.



Manager's office of the Birmingham branch.

Offices in Oklahoma

The interior lighting of the Warren Petroleum Corporation building in Tulsa, Oklahoma, is apparent from the exterior at night, since the translucent ceilings produce a series of rectangular blocks of light with a background pattern of cross hatching. The lighting was designed by Skidmore, Owings & Merrill, architect-engineers, Chicago. The lighting equipment was produced by The Wakefield Company, Vermilion, Ohio. It provides a type of broad-area lighting similar to that given by a luminous ceiling, but maintenance is said to be simplified. The diffusers, which constitute about 60 per cent. of the ceiling area, swing down for maintenance.

Lighting is provided by continuous rows of units, each about 3 ft. x 5 ft. x 9 in. deep, separated by rows of 2 ft. metal pans which snap into the supporting grid. There are 3,000 of these lighting units, suspended from yokes on special half-tee sections of the metal grid. Each unit contains two 40-watt fluorescent lamps with provisions for a third where a higher level of illumination is required. The brightness of the diffuser panels is similar to that of a fully luminous ceiling of equivalent output.

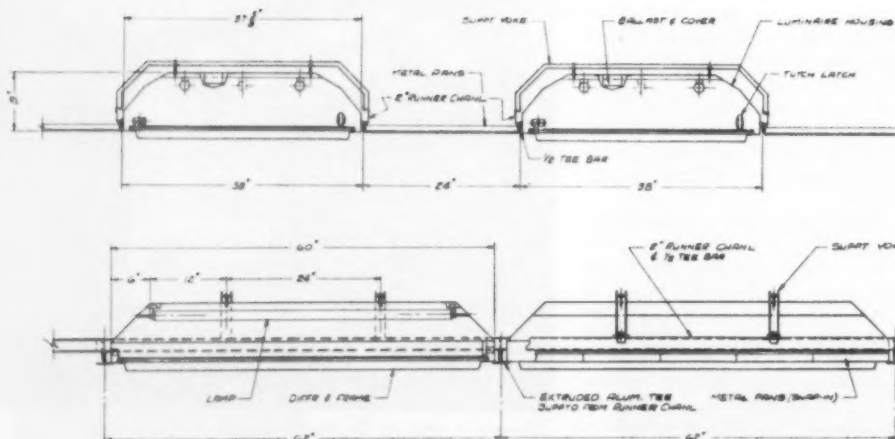


Above: Exterior of the Warren Petroleum Corporation building at night.



Left: Interior of one of the offices.

Below: Detail of the ceiling.



Section perpendicular to lamps.

Section parallel to lamps.

Personal

MR. GRAHAME D. DEACON has been appointed Sales Lighting Engineer, Holophane Ltd., and will represent the Company in the East Midlands, based on Nottingham. He succeeds Mr. E. J. MARA, who has left Holophane.

The Benjamin Electric Ltd. announced that they have created a new area in the outside Sales Force which will be known as the "South West Area," with offices at Royal London Buildings, Baldwin Street, Bristol (telephone number Bristol 28406). It will include the geographical area covered by the South Western Electricity Board, South Wales Electricity Board, Central Gloucestershire Area of the Midlands Electricity Board, and the County of Wiltshire in Newbury Sub-Area of the Southern Electricity Board. Mr. R. H. HILL, who for a number of years has been their Sales Engineer in Bristol and the South West of England, has been appointed Manager. Mr. B. G. ASH, who has had eighteen years' experience in contracting and the electrical industry, joins Mr. Hill's team of Sales Engineers, having for the last few years operated from Bristol for Veritys; Mr. J. D. DUCKER, who has operated in the Northern Area covering Bolton, Preston, Blackburn and other parts of Lancashire, transfers to the Midland Area, and will take over the Merseyside and North Wales territories.

MR. H. E. G. WATTS of 159 Swakeleys Road, Ickenham, Middx., is now in private practice as a consultant on mechanical and electrical engineering. Mr. Watts was formerly with the Lighting Department of the B.T.H. Co. Ltd. in London and until recently was with the Engineering and Lighting Equipment Co. Ltd. of St. Albans.

MR. R. J. FOTHERGILL has joined the design staff of the Maxlume Division of Veritys Ltd. and is based at the Company's works in Birmingham.

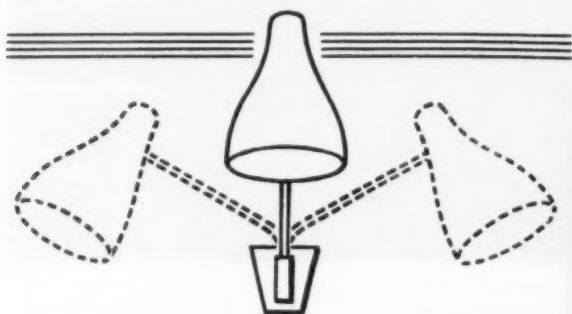
Mr. Fothergill, who holds the City and Guilds Full Technological Certificate in Illuminating Engineering and has also qualified in electrical installation work, was with A. Reyrolle and Co. Ltd. before joining the Lighting Service Bureau (now the British Lighting Council), whom he leaves after seven years.

MR. R. J. BUCKINGHAM has been appointed Area Manager of the South Wales Branch of Ekco-Ensign Electric Ltd., at Cardiff, following the departure of Mr. A. J. DAVIES to Thorn Electrical Industries (Australia) Pty. Ltd. Mr. STANLEY BUGDEN, the new Eastern District Manager, has been with the Company for the last seven years, being particularly well known in electrical circles in both Luton and Bedford.

MR. H. H. ASH, representative of the Lighting Division in North Wales of Philips Electrical Ltd. for most of the past thirty-one years, has retired. His duties will be taken over by Mr. G. T. JONES. Mr. W. W. COOKE, Lighting Representative with the South-East Region, has also retired after completing nearly 29 years' service with the Company.

MR. A. H. BAKER has joined the sales staff of AEI Lamp and Lighting Co., Ltd., at their Northampton office. Mr. F. C. CHOWN, Newcastle Area Superintendent, has retired and will be succeeded by Mr. J. E. SUTTON.

MR. A. J. DAVIES, previously Western Wales Manager for Ekco-Ensign Electric Ltd. at Cardiff, has been appointed Sales Manager of the Lighting Division, Thorn Electrical Industries (Australia) Pty. Ltd.



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Clerk to the Governing Body.

Trade Literature

J. A. CRABTREE AND CO. LTD., Lincoln Works, Walsall—Leaflet giving details of Type-60 miniature circuit breakers with price list. Also catalogue No. 1194 which is a comprehensive survey of new wiring accessories and miniature circuit breakers which have been added to the firm's range during the past year with prices given.

KNIGHTSHADES LTD., Silverhill Works, Theaklen Drive, St. Leonards-on-Sea, Sussex—List No. 70, an illustrated booklet giving details and prices of decorative lighting fittings, wall brackets, floor and table lamps and lamp-shades.

THE MERCHANT ADVENTURERS LTD., 43, Portland Road, London, W.11—Brochure giving details and prices of the "Ellipse" range of lighting fittings.

W. J. PARRY AND CO. (NOTTINGHAM) LTD., Victoria Mills, Draycott, Derbyshire—Fully illustrated catalogue of Auxiliary Gear for Electric Discharge Lamps with price list.

PRECISION COMPONENTS (BARNET) LTD., 13, Byng Road, Barnet, Herts—Leaflet giving particulars and prices of KABI 2.B.A. and KABI Q.B.A. Unit Terminal Blocks.

STRONG ELECTRIC CORPORATION LTD., Whyteleafe, Surrey—Details of "Anticor" Strong's latest anti-corrosive fluorescent lighting fittings are to be found in their latest illustrated catalogue.

POSTSCRIPT By 'Lumeritas'

MANY readers will probably be on holiday this month and, with reasonable luck, will be basking in the summer sun. Some may be wearing sun-glasses or, perhaps, the light cotton peaked anti-glare cap of American pattern that seems to be gaining some popularity here. Time was when the "boater" and the "panama" held the field as head and eye protectors from overmuch solar radiation, but the vagaries of our British climate have all but destroyed the demand for these hats. But, when we are treated to a reasonable quota of summer sunshine, how much more attractive does the fair sex appear in shady products of the milliners' art than in sombre glasses that substitute two almost black patches for a pair of sparkling eyes? And how silly it seems to dim the effulgent summer scene (unless one is otherwise made quite uncomfortable) rather than to stop at shading the eyes by an artificial eyebrow from sun and sky glare—which is generally all that is really necessary. However, if shady hats are *démodé*, or otherwise inconvenient, the ladies might do worse than wear eye-masks. These could be made very light in weight and decorative in appearance and the mere male might then catch an occasional glint to assure him of the presence of living eyes behind the slits. As for the male himself, let him eschew the mask and also the dense dark glasses. Even he looks better in a shady hat, although, admittedly, the "hobo" type of peak headwear is not smart.

IN a brightly lighted interior—say, a large office—it may be very difficult or very expensive to keep "sky" glare low enough to please everyone. Ceilings often are not high, and to obtain a high level of illumination many light sources are needed. In almost any position in such an interior there may be one or more light sources whose angle of elevation from the horizontal direction of view is too great for the source or sources to be visible as such, and yet we are aware of light reaching the eyes from them. Holding the hand up to the forehead, so as to canopy the eyes more than the eyebrows do, usually makes us a little more comfortable and often seems to make us see a little better. Why is it then that eye-shades—like those sometimes worn by tennis players—are so seldom used by people indoors who need plenty of light for their work but are not perfectly happy in the downpour of light on its way to their work? Why should the lighting engineer always be expected to prevent the occurrence of all discomfort in artificial lighting? The cost of doing so may be prohibitive or, in avoiding all possibility of glare, the lighting may be made to produce a most insipid luminous environment. Why should not those individuals who are most sensitive to the kind of effect I am discussing equip themselves with some individual protective device? This is the cheapest and maybe the best course of action. Of course, I do not mean that lighting engineers should not bother to design installations which, so far as is reasonably practicable, will cause no glare but should throw the onus of protection from glare on the users individually. But I do not see why, in

some circumstances, users should not do a little to help themselves.

QUITE recently it was reported that a gang of teenage youths wrecked illuminations equipment on Southend cliffs one night, throwing pieces of equipment over the cliffs and smashing hundreds of coloured lamps. Damage to the value of about £200 was done. From other places there have been recent complaints of extensive wilful damage to street lamps by irresponsible hooligans. So many street lamps have thus been damaged in Willesden that the council has decided to fit wire guards. Vandalism appears to be on the increase, and it is not only public lighting equipment that is wantonly damaged by oafs who have yet to be taught to control their anti-social destructive impulses. These wreckers should be thankful that, even if they are caught, the law will deal with them far more leniently than they deserve. Only 150 years ago, wilfully damaging public property of some kinds was a felony punishable by transportation for life, and, even in the early Victorian years, the maximum penalty could be penal servitude for life! Without wishing for any return to such harshness, I am sure there must be many people who, like myself, feel it is time to make the destruction of public property a "sport" much less harmless to its devotees than it is now.

NO doubt many a romance had its origin in the vicinity of a gas street lamp and many a tender "good-night" has passed between lovers and lasses while the former gazed rapturously at the gas-lit countenance of the latter. But at least one "romance" of a different kind began with a meeting beneath a street gas-lamp. Forty-seven years ago under what is said to be Peckham's only remaining gas street lamp there was a meeting between a Major Lisle Watson and a group of boys at which it was decided to form a Scout troop with headquarters in a derelict cowshed in Pitt Street. Subsequently, a hall was built on the site of the cowshed and the original project was expanded and there grew up a social service centre, now known as the Pitt Street Settlement. Major Watson is still the warden of this Settlement and the Scout troop is still associated with it. The gas lamp is preserved because of the part it played in the birth of this Settlement, the anniversary of which was celebrated a fortnight ago by lighting the lamp for the day.

FROM the *Illustrated London News* 100 years ago: "Now ready, Third Edition, enlarged, price 6s. Laurent de Lara's *Elementary Instructions of Illuminating*. Dedicated by permission to the Viscountess Dungarvan. Ackermann & Co. 106, Strand." Despite its title, this work had nothing to do with illuminating as do Diploma Members of the I.E.S. Also, 100 years ago the still existing street lighting of a certain Norfolk town was installed, and the Council has just been told by the Chamber of Trade that the lighting is a disgrace to the town! It has certainly had a good innings.



they're looking up and taking notice!

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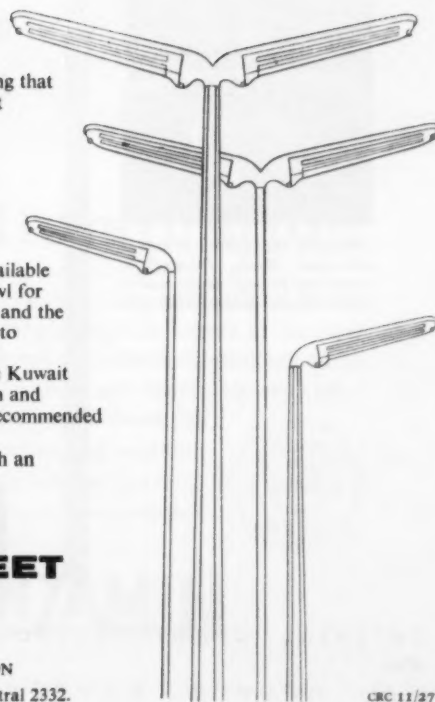
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CRC 11/27



Mandarin Hat lighting fittings in Britannia House, Birmingham, made from 'Perspex' acrylic sheet by Fulford Brown Brothers (1929) Ltd.

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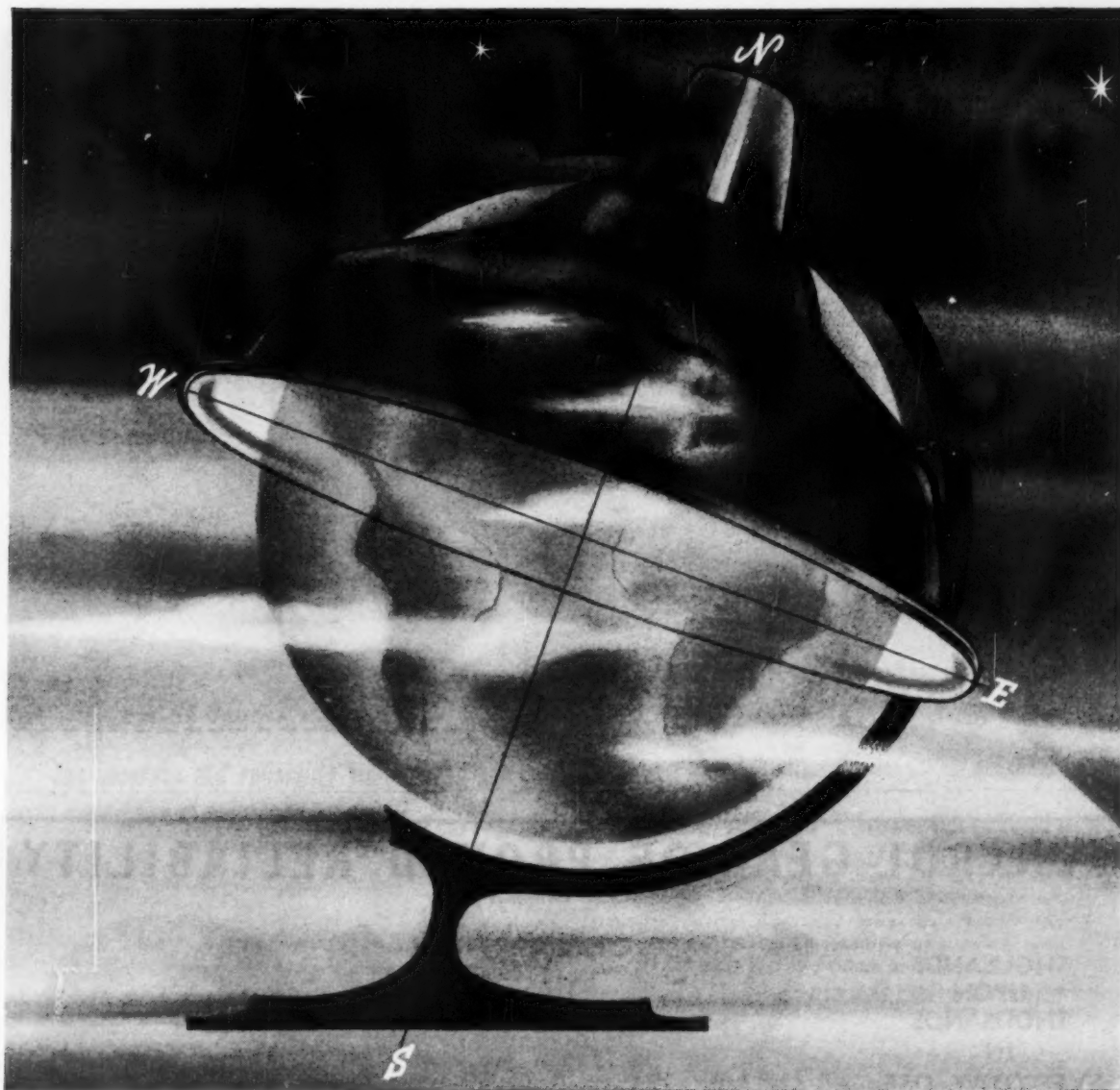
• PERSPEX •

'Perspex' is the registered trade mark for the acrylic sheet manufactured by I.C.I.

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A word or two on illumination

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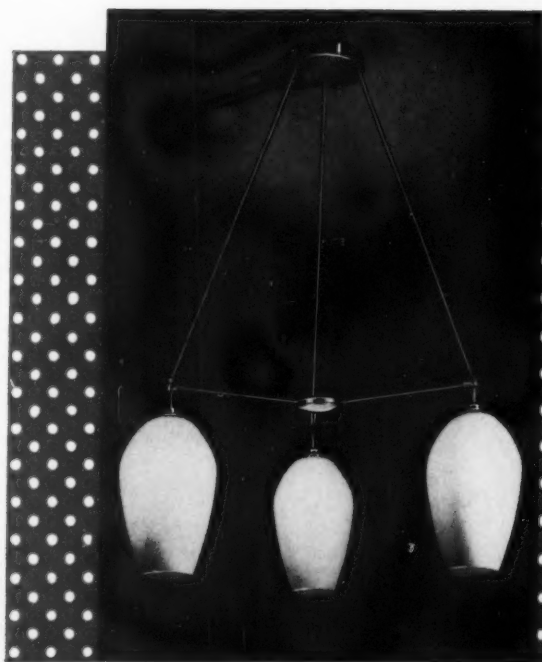
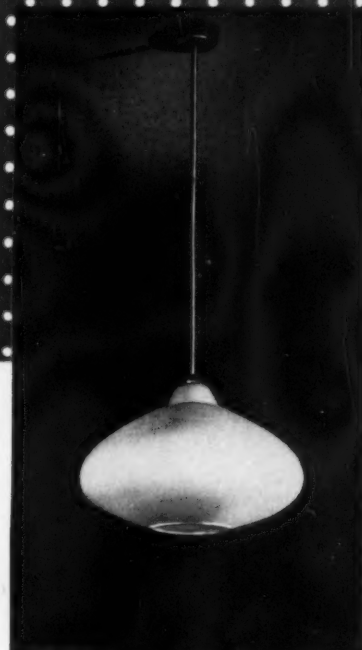
Published by THE ILLUMINATING ENGINEERING PUBLISHING COMPANY LIMITED, at 32 Victoria Street, London, S.W.1. Printed by ARGUS PRESS LIMITED, Temple Avenue, and Tudor Street, London, E.C.4, England.



These illustrations are typical of many variations possible with the Satima range of contemporary fittings. Shades are available in white satin opal and soft satin pink.

"Hailware"

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Britain is changing

Illustration: The Wiggins Teape building near St. Paul's Cathedral in London. Modern but with a strong traditional bias, this office block has concealed exterior lighting above the windows to give it as strong an identity by night as by day.

Architects: Treherne and Norman Preston and Partners.

Britain today is changing. Everywhere the bomb-sites are disappearing, out-of-date property is being demolished, and tradition is merging with the cosmopolitan influences of present-day world architecture. There is enormous scope for lighting development to keep pace with the ever-increasing standards being adopted by leading designers, for excellent though many new installations are, the fringes of the progress that could now be made have really only just been touched.

By today's standards, how many homes are really well lit? How many factories have lighting conditions planned for production and welfare rather than for economy? How many shops outside our town and city centres are really letting lighting help them as it should? The fact is that many installations considered good ten years ago are now a long way behind the times, and the same again will happen in less than ten years from now. Lighting development from every point of view has room to stretch and grow to the benefit of all concerned.

The lighting industry is a great one, full of hope and promise, and the British Lighting Council intends to do everything in its power to bring better lighting to the millions for whom it can create a fuller and better way of life.

